Vol. 899 Number 3

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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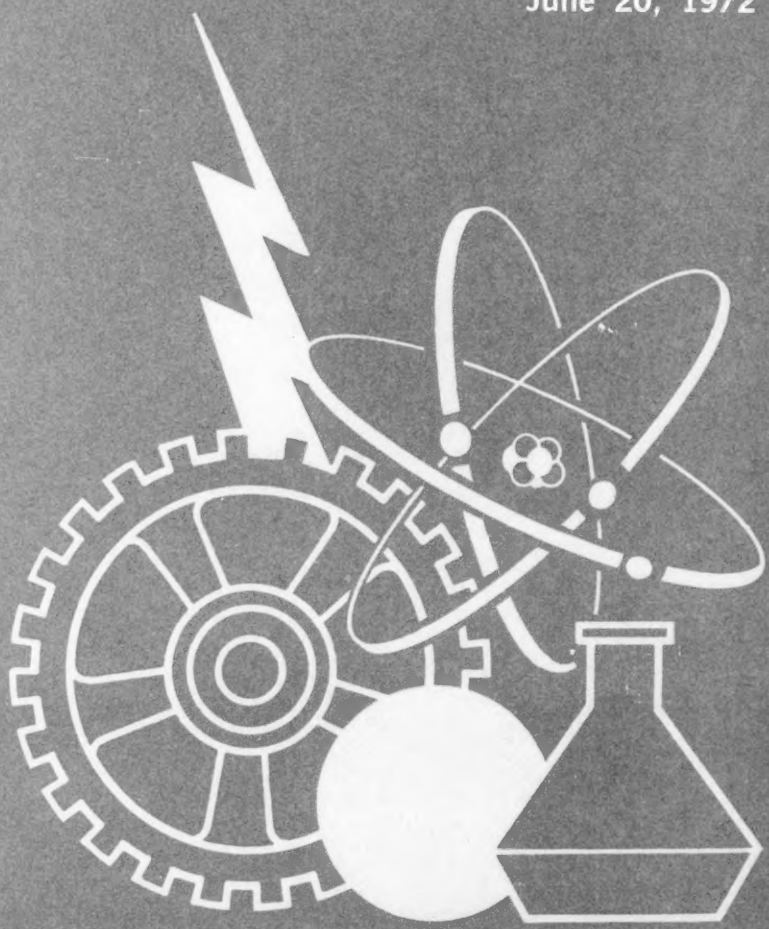
PATENTS

June 20, 1972



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

June 20, 1972 Volume 899 Number 3

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PATENT OFFICE NOTICES

Claims Versus Abstracts for Publication in the Patent Official Gazette

Abstracts have been required for all patent applications filed since January 1, 1967. Subsequent to the requirement for abstracts, the Office began substituting abstracts for patent claims in the OFFICIAL GAZETTE. At the present time, abstracts ars used exclusively in the OFFICIAL GAZETTE to describe the inventions for which patents issue each week.

Over the last several months, the Office has become increasingly aware of the disparity of views which exist regarding the merits of the publication of claims or abstracts in the OFFICIAL GAZETTE. The utilization of abstracts in the OFFICIAL GAZETTE was initially base on a desire to make that publication more useful to the non-patent community. However, it now appears that a significant portion of the patent community, especially in the chemical area, would prefer the publication of claims in the OFFICIAL GAZETTE as more useful than the publication of abstracts.

To assist the Office in resolving this issue, it is requested that interested parties submit their comments in writing prior to January 1, 1973. Such comments should be addressed to the Commissioner of Patents, Washington, D.C., 20231.

ROBERT GOTTSCHALK,
May 22, 1972. *Commissioner of Patents.*

Solicitation of Public Views Concerning Changes in Patent Office Practices and Procedures

In the effort to continually improve operations and to respond to changing circumstances, the procedures and practices of the Patent Office are revised from time to time. While comments are requested and public hearings held on proposed changes in the Rules of Practice, changes in other practices and procedures of the Office have generally been implemented on the basis of informal and more limited liaison with our constituents. This has, on occasion, given rise to inquiries as to the reasons for and wisdom of certain of these changes, as well as to criticisms and proposals for further changes.

While all changes in procedure must take into consideration the efficient operation of the Patent Office, we have determined that on a trial basis, we will, where appropriate, solicit views and comments of the patent community so that they might be taken into account in shaping the procedures of the Patent Office. The solicitation of such views will focus primarily on proposed changes in practices and procedures of the Office which have substantial impact on individuals dealing with the Patent Office. Our first such effort involves the question of whether claims or abstracts are more appropriate for publication in the OFFICIAL GAZETTE, and this is the subject of a separate notice in this issue.

Whether this practice of public participation is continued will depend in large part upon the public response to notices of this nature. In the past, public response to the solicitation of views has been rather limited and has principally been from those who were opposed to proposed changes in rules and practices. Accordingly, it is requested that interested parties submit their views irrespective of whether they agree or disagree with the proposal under consideration.

ROBERT GOTTSCHALK,
May 22, 1972. *Commissioner of Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,672,675, R. E. Cross, LOCATING AND CLAMPING MECHANISM, **filed** Apr. 10, 1968, D.C., E.D. Mich. (Detroit), Doc. 31134, *The Cross Company* v. *Buhr Machine Tool Company.* Final order, claim 13 of Cross patent valid; claim 13 has been infringed, Feb. 28, 1972.

2,715,309, Rosenstein and Rosenstein, SYNTHETIC CONTINUOUS FILAMENT YARN IN THE CONTINUOUS FILAMENT YARN STATE, **filed** Feb. 4, 1972, D.C., W.D.N.C. (Charlotte), Doc. C–72–30, *Joseph Bancroft & Sons Co.* v. *Jesco Knitwear Corporation and Jessee Halperin.*

2,742,378, T. A. Te Grotenhuis, FILLERS HAVING VINYL SILOXANE GROUPS BONDED TO THE SURFACE THEREOF AND COPOLYMERS THEREOF WITH ETHYLENICALLY UNSATURATED POLYMERIZABLE MONOMERS, **filed** Sept. 12, 1962, D.C., N.D. Ohio (Cleveland), Doc. C–62–681, *Westwood Chemical, Inc.* v. *Ferro Corporation.* Order Dismissing complaint at plaintiff's costs, Mar. 20, 1972.

2,764,830, E. Frey, ARTICULATED BANNER UNIT CONSTRUCTION, **filed** June 20, 1969, D.C., S.D.N.Y., Doc. 69–C–2682, *McCoy-Gold Merchandising Inc.* v. *Massillon-Cleveland Akron Sign Co.* Stipulation and order that the complaint be dismissed without prejudice, Mar. 14, 1972.

2,779,236, D. Polian, FILM PROJECTOR COOLING MEANS, **filed** Mar. 6, 1972, D.C., E.D.N.Y. (Brooklyn), Doc. 72–C–298, *Viewlex, Inc.* v. *A/V Concepts Corp. and Utopia Precision Machine Corp.*

2,795,564, Conn, Kine and Prentiss, AQUEOUS PAINT BASES AND WATER-BASE PAINTS AND PROCESS FOR PREPARING THEM, **filed** Oct. 19, 1971, D.C.N.J. (Newark), Doc. C–1538–71, *Rohm and Haas Co.* v. *Adco Chemical Co.*

2,883,927, L. E. Egbert, PNEUMATICALLY OPERATED IDENTIFICATION MARKER, **filed** June 22, 1970, D.C., E.D. Mich. (Flint), Doc. 447, *Air-Impac Co.* v. *Columbia Marking Tools, Inc.* By stipulation, complaint and counterclaim dismissed with prejudice, Feb. 29, 1972.

2,906,875, E. T. Molinaro, STATION SAMPLING RADIO, **filed** Apr. 12, 1972, D.C., M.D. Pa. (Scranton), Doc. 72–179, *Edward T. Molinaro and Anthony P. Catanzaro* v. *Eynon Drug Store.*

2,909,384, M. F. Saxton, MAGNETIC DOOR CATCH, **filed** July 29, 1970, D.C., E.D.N.Y. (Brooklyn), Doc. 70–C–933, *The Engineered Products Company* v. *U.S. Industrial Products Corp. and Advanced Affiliates Inc.* Consent judgment, Mar. 6, 1972.

2,917,790, V. F. Espenschied, PRE-ASSEMBLED DOOR AND CASING, **filed** May 24, 1966, D.C., N.D. Ohio (Cleveland), Doc. C66–371, *The F. E. Schumacher Company* v. *Reynolds Metals Company* v. *Feather-Lite Manufacturing Co.* Memorandum and order granting judgment in favor of defendant Reynolds Metals Co. and the intervenor Feather-Lite Mfg. Co. and against the plaintiff, Feb. 25, 1972.

2,919,061, B. D. Power, VAPOUR VACUUM PUMPS, **filed** Apr. 9, 1964, D.C., W.D.N.Y. (Buffalo), Doc. C–10,884, *NRC Equipment Corporation and Edwards High Vacuum International Limited* v. *Consolidated Vacuum Corporation.* Order of dismissal for want of prosecution, Mar. 10, 1972.

2,940,530, W. H. Du Shane, DRAFT LOAD CONTROL FOR TRACTORS, **filed** Apr. 5, 1972, D.C., N.D. Ill. (Freeport), Doc. 72c22, *Deere & Co.* v. *Ford Motor Company and Belvidere Ford Tractor, Inc.* **Same, filed** Apr. 5, 1972, D.C., N.D. Ill. (Freeport), Doc. 72c23, *Deere & Co.* v. *Allis Chalmers Corp. and Stouffer's One Stop Farm Store, Inc.* **Same, filed** Apr. 5, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c852, *Deere & Co.* v. *International Harvester Co.*

2,967,119, R. P. Gutterman, ULTRASONIC PROCESS AND APPARATUS, **filed** Oct. 19, 1970, D.C. Del. (Wilmington), Doc. 3997, *Lipsner-Smith Corporation* v. *Clean Air, Inc.* Final judgment by consent, defendant is permanently enjoined, Mar. 6, 1972.

3,015,969, O. J. Bratz, PUSH-PULL CABLE, **filed** Nov. 18, 1966, D.C., S.D.N.Y., Doc. 66–C–3918, *American Chain & Cable Company* v. *Phillips Hardware, Inc.* Filed order of dismissal without costs, Mar. 20, 1972.

3,017,087, A. V. Bodeen, REGISTERING DEVICE, **filed** June 7, 1967, D.C., S.D.N.Y., Doc. 67–C–2210, *Ideal Toy Corporation* v. *Mattel, Inc.* Defendant's motion for summary judgment denied and plaintiff's motion to dismiss Case No. 71–C–3231 granted, Jan. 17, 1972. Judgment No. 72,285, plaintiff awarded summary judgment in action 67–2210, Feb. 23, 1972.

3,018,182, J. M. Leach, PROCESS AND APPARATUS FOR TREATING MATERIALS, **filed** Mar. 17, 1965, D.C., S.D.N.Y., Doc. 65–C–792, *John M. Leach* v. *Penick & Ford, Ltd., Inc.* Filed stipulation of dismissal pursuant to F.R.C.P. Rule 41(a)(1)(ii), Apr. 3, 1972.

3,053,011, B. B. Silverman, SYSTEM AND APPARATUS FOR HYDROPONIC GROWING, **filed** Mar. 1, 1972, D.C., M.D. Fla. (Tampa), Doc. 72–115–C, *Frances A. Silverman* v. *Clifton Jordan.*

3,068,484, Moehlenpah and Pallme, APPARATUS FOR FABRICATING WOOD STRUCTURES; **3,069,684,** same, **filed** June 30, 1971, D.C., E.D. Tenn. (Knoxville), Doc. 7523, *Hydro-Air Engineering, Inc.* v. *Building Component Machinery Co., Inc. and Sidney Gwyn.* Consent decree, patents valid and defendants infringed said patents, permanent injunction issue, Mar. 27, 1972.

3,069,684. (See 3,068,484.)

3,090,605, Copeland and Neier, FEED MIXER, **filed** Mar. 15, 1972, D.C. Kans. (Wichita), Doc. W–4812, *Hydraulics Unlimited Mfg. Co.* v. *B/J Manufacturing Co., Inc. et al.* **Same, filed** Mar. 24, 1972, D.C. Kans. (Wichita), Doc. W–4816, *B/J Manufacturing Co., Inc.* v. *Hydraulics Unlimited Mfg. Co.*

3,093,528, R. L. Reich, LABEL APPLYING MEANS, **filed** Dec. 22, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–3021–IH, *Compac Corporation* v. *John B. French, doing business as Better Built Engineering.*

3,093,545, Westfall and Lewis, THERAPEUTIC IRON-DEXTRON PREPARATIONS, **filed** Apr. 3, 1972, D.C., W.D. Mo. (Kansas City), Doc. 20238–3, *Armour Pharmaceutical Company* v. *Med-Tech, Inc.* **Same, filed** Apr. 4, 1972, D.C. Md. (Baltimore), Doc. 72–344–Y, *Armour Pharmaceutical Company* v. *John D. Copanos & Co., Inc.*

3,313,355, L. M. Pierce, APPARATUS FOR SUPPORTING AND CONTROLLING POWER FASTENER TOOLS AND THE LIKE, **filed** Oct. 24, 1969, D.C., N.D. Iowa (Cedar Rapids), Doc. 69–C–31–CR, *Clary Corporation* v. *Douglas, Inc., Henderson Metal Products, Inc., L. Merle Pierce, and James C. Cooper.* Stipulation and consent judgment, action by Clary Corp. against Henderson Metal Products, Inc. dismissed without prejudice. Action by Henderson Metal Products, Inc. against Clary Corp. dismissed without prejudice. Defendants have infringed and entered into a settlement agreement. All Claims, counterclaims and crossclaims are dismissed, Mar. 21, 1972.

3,484,835, Troustine and McCauley, EMBOSSED PLASTIC FILM, **filed** Apr. 11, 1972, D.C. Del. (Wilmington), Doc. 4363, *Clopay Corporation* v. *Associated Baby Services Incorporated, Blessings, Incorporated.*

3,522,701, W. G. Perry, AUDIBLE TIMING DEVICE, **filed** Apr. 5, 1972, D.C. Mass. (Boston), Doc. 72–1200–C, *Damon Corporation* v. *The Sippican Corporation and Eduquip, Inc.*

3,534,490, D. P. Herbert, SECTION FRAME, **filed** Jan. 5, 1972, D.C., E.D.N.Y. (Brooklyn), Doc. 72–C–24, *Structural Industries, Inc.* v. *Gerson Enterprises.* Action dismissed, Mar. 31, 1972.

3,552,154, B. G. Lesley, KNIT FABRIC, **filed** Mar. 28, 1972, D.C., W.D.N.C. (Statesville), Doc. ST–C–72–10, *Deering Milliken Research Corporation* v. *Beaunit Corporation.*

3,561,146, R. H. Dembar, PHOTOGRAPH DISPLAY APPARATUS, **filed** May 6, 1971, D.C., E.D. Mich. (Detroit), Doc. 36460, *Graphicana Corp.* v. *Baia Corp.* Order granting defendant's motion for summary judgment, Mar. 20, 1972.

3,594,964, W. T. Clark, PLANETARIUM PROJECTION DOME, **filed** Apr. 5, 1972, D.C., E.D. Pa. (Philadelphia), Doc. C.A. 72–679, *Observa-Dome Laboratories, Inc.* v. *McGraw-Hill, Inc. and Spitz Laboratories, Inc.*

3,601,385, Senter and Johnson, ATTACHMENT FOR CHANGING REAREND SUSPENSION IN AUTOMOBILES, **filed** Sept. 29, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2346–HP, *Ansen Automotive Engineering, Inc.* v. *Roy H. Gammell et al.* Judgment by consent, defendants have infringed and are permanently enjoined, Apr. 3, 1972.

Certificates of Correction for the Week of June 20, 1972

3,459,553	3,620,270	3,629,426	3,639,992
3,475,561	3,620,326	3,629,575	3,640,075
3,479,168	3,620,724	3,630,469	3,640,114
3,508,885	3,620,954	3,630,673	3,640,281
3,522,687	3,621,106	3,630,741	3,640,360
3,540,283	3,621,204	3,630,805	3,640,461
3,541,937	3,621,374	3,630,844	3,640,562
3,552,961	3,621,396	3,631,044	3,640,585
3,552,962	3,621,470	3,631,045	3,640,743
3,552,963	3,621,851	3,631,154	3,640,760
3,552,964	3,621,913	3,631,168	3,640,765
3,552,965	3,622,630	3,631,397	3,640,885
3,553,121	3,622,971	3,631,675	3,640,928
3,568,922	3,623,069	3,631,876	3,641,067
3,573,222	3,623,330	3,632,373	3,641,147
3,575,522	3,623,718	3,632,408	3,641,168
3,582,703	3,623,772	3,632,539	3,641,191
3,584,386	3,623,866	3,632,563	3,641,222
3,585,040	3,624,113	3,632,704	3,641,382
3,585,216	3,624,117	3,632,778	3,641,775
3,585,965	3,624,480	3,633,574	3,642,017
3,590,219	3,624,574	3,634,404	3,642,469
3,592,530	3,625,085	3,634,416	3,642,583
3,592,870	3,625,414	3,634,429	3,642,667
3,593,689	3,625,423	3,635,230	3,642,714
3,596,359	3,625,751	3,635,956	3,642,796
3,597,412	3,625,847	3,636,112	3,642,962
3,598,294	3,625,896	3,636,190	3,643,061
3,600,103	3,626,035	3,636,262	3,643,135
3,600,610	3,626,036	3,636,447	3,643,332
3,600,964	3,626,313	3,636,559	3,644,176
3,601,813	3,626,576	3,637,641	3,644,295
3,603,039	3,626,816	3,637,703	3,644,420
3,605,610	3,626,864	3,637,737	3,644,506
3,608,694	3,626,965	3,637,763	3,644,529
3,609,125	3,627,048	3,638,402	3,644,573
3,609,377	3,627,057	3,638,424	3,644,648
3,612,951	3,627,061	3,638,559	3,644,909
3,613,878	3,627,351	3,638,603	3,645,140
3,615,388	3,627,469	3,638,833	3,645,489
3,615,794	3,627,512	3,639,004	3,645,745
3,616,088	3,627,751	3,639,126	3,645,770
3,617,124	3,627,811	3,639,319	3,645,810
3,617,600	3,628,116	3,639,346	3,645,969
3,618,099	3,628,615	3,639,561	3,645,997
3,618,103	3,628,639	3,639,585	3,646,452
3,619,123	3,628,867	3,639,670	3,646,743
3,619,306	3,629,092	3,639,772	3,647,019
3,619,766	3,629,265	3,639,801	3,647,770
3,620,015	3,629,375	3,639,974	3,651,437

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 16, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-18-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	3-03-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-09-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	9-21-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-12-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-19-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	3-01-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-19-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	3-23-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	3-01-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-12-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	5-21-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods: Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	3-18-71

Expiration of patents: The patents within the range of numbers indicated below expire during June 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,700,808 to 2,712,130, inclusive
Plant Patents ..... Numbers 1,396 to 1,403, inclusive

REISSUES

JUNE 20, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,390

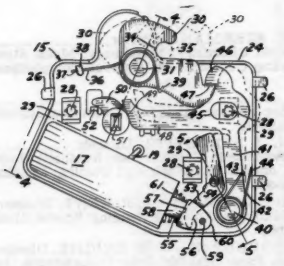
ELECTRIC LOCK RELEASE

Perry E. Allen, 4644 Round Hill Road, Birmingham, Mich. 48010

Original No. 3,504,511, dated Apr. 7, 1970, Ser. No. 710,136, Mar. 4, 1968. Application for reissue Nov. 18, 1970, Ser. No. 90,550

Int. Cl. E05b *65/19*

U.S. Cl. 292—201 12 Claims



The application discloses a trunk lock and a remotely controlled, electrically operated, lock release mechanism for an automobile. The invention resides in the particular construction and arrangement of the elements, which enables the entire assembly, except the control harness, to be specified by the automobile manufacturer, for manually self-contained and to be mounted within the limitations specified by the automobile manufacturer, for manually operated locks of the same kind.

27,391

CONNECTOR FOR HOLDING ARTICLES TOGETHER

Francis G. Merser, Framingham, Mass., assignor to Dennison Manufacturing Co., Framingham, Mass.

Original No. 3,462,802, dated Aug. 26, 1969, Ser. No. 721,365, Apr. 15, 1968, which is a continuation of Ser. No. 684,685, Nov. 21, 1967. Application for reissue Oct. 12, 1970, Ser. No. 80,259

Int. Cl. A44b *9/00*; B65d *63/00*

U.S. Cl. 24—16 PB 5 Claims

A connector comprising a filament having a socket and a series of heads distributed along the filament to snap through the socket to form loops of different sizes.

27,392

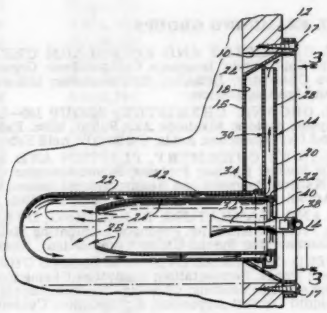
HEATER CONSTRUCTION

Donald E. Robinson, Northville, Mich., assignor to Mobil Temp, Inc., Dayton, Ohio

Original No. 3,353,528, dated Nov. 21, 1967, Ser. No. 514,358, Dec. 16, 1965. Application for reissue Dec. 18, 1970, Ser. No. 99,618

Int. Cl. F24c *3/00*

U.S. Cl. 126—91 A 50 Claims



A heater generally for domestic use and having a vertical vent tube and a horizontally extending heat exchanger tube and a flame tube located generally within the heat exchanger tube.

27,393

CONTROL APPARATUS FOR AN ELECTRICALLY OPERABLE DEVICE

Edward C. Aselman, Jr., High Ridge, Mo., assignor to T.N.E. Incorporated

Original No. 3,435,289, dated Mar. 25, 1969, Ser. No. 516,206, Dec. 7, 1965. Application for reissue Mar. 24, 1971, Ser. No. 127,855

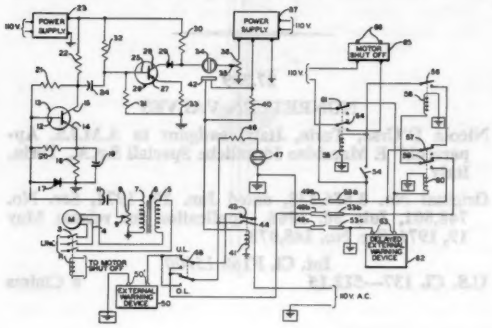
Int. Cl. H02h *7/06, 7/08, 7/10*

U.S. Cl. 317—13 R 23 Claims

[An electrical current sensor for operative connection to an electrical device such as a motor powered pump for sensing current input to the motor. The sensor includes a transformer to detect current input and an amplifier to increase the measured change in current level. The sensor produces an error signal when the current either falls below or exceeds a pre-established level, and a reference voltage signal for comparison with the error signal, in a summating circuit. A switch is connected to the summating circuit and causes energization of an alarm when the current input to the pump exceeds or falls below the pre-established value. An automatic disconnect device is optionally connected to the sensor and motor for automatically de-energizing the motor upon sensing of the undesirable current level.]

Control apparatus responsive to changes in the current supplied to an electrically energized device. Current sens-

ing means provides an A.C. voltage signal whose magnitude is a function of the magnitude of the current. Circuit means is provided for supplying a pulsating D.C. signal whose magnitude is a function of the magnitude of the A.C. voltage signal. A triggerable glow discharge device is adapted for being triggered by the pulsating signal to provide a glow discharge upon the pulsating signal at-



taining a predetermined magnitude. Control means includes a light-sensitive transducer adapted to be illuminated by the glow discharge for supplying a control signal. Thus the control signal is supplied when the current reaches a predetermined magnitude. Preferably, the control means includes apparatus for automatic disconnection of the device after a predetermined time delay interval following supplying of the control signal.

27,394

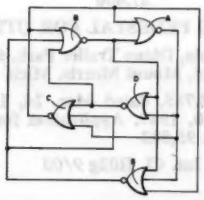
CLOSED LOOP LOGIC GATE MULTIPLE PHASE CLOCK SIGNAL GENERATOR

Gary L. Heimbigner, Anaheim, Calif., assignor to North American Rockwell Corporation

Original No. 3,539,938, dated Nov. 10, 1970, Ser. No. 787,719, Dec. 30, 1968. Application for reissue May 27, 1971, Ser. No. 147,556

Int. Cl. H03k *3/02*

U.S. Cl. 331—57 **10 Claims**



Output signals from the logic gates of an oscillator circuit represent sequential digital *states* [stagtes]. Output signals having certain related intervals are combined as inputs to the logic gates to produce multiple phase clock signals having a desired symmetry and relationship without the necessity for decode logic at the output of the oscillator.

27,395

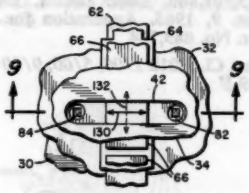
SOLID STACK MEMORY

Robert J. Bergman, St. Paul, and Le Roy A. Prohofsky, Minneapolis, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Original No. 3,435,435, dated Mar. 25, 1969, Ser. No. 504,543, Oct. 24, 1965. Application for reissue Dec. 22, 1969, Ser. No. 10,661

Int. Cl. G11c *11/14, 5/04*

U.S. Cl. 340—174 BC **26 Claims**



An electrically-alterable, random-access memory system that uses mated-film elements as the memory cells with orthogonally oriented drive fields.

27,396

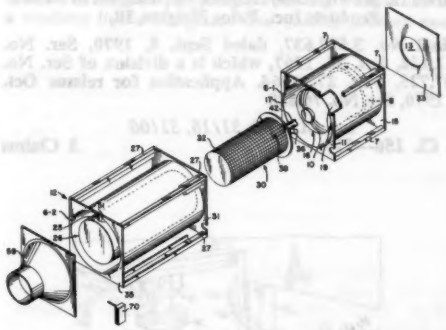
WARM AIR FURNACE WITH RADIANT BURNER

Raymond A. Hemmert, Columbus, Ohio, assignor to Columbia Gas System Service Corporation, New York, N.Y.

Original No. 3,507,481, dated Apr. 21, 1970, Ser. No. 708,691, Feb. 27, 1968. Application for reissue Jan. 6, 1971, Ser. No. 104,526

Int. F23l *15/04*

U.S. Cl. 263—20 **11 Claims**



A compact or miniaturized furnace is disclosed having very compact blower or fan and heating sections. A stream of air to be heated is drawn into an end of an elongated casing and is directed radially outwardly and thence longitudinally to the casing through an annular passageway which extends through the heating zone. Within the heating zone the air passes along the outside of the cylindrical primary heating surface and the air also passes around a spiral tubular flue for the exhaust or furnace gases. The primary heating surface receives heat from an infrared

radiant burner enclosed within the cylindrical wall and the exhaust gases flow through the spiral flue in countercurrent relationship to the direction of flow of the air being heated.

27,397

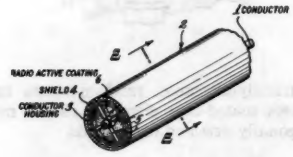
ELECTRICAL CONDUCTOR CONTAINING AN IONIZABLE GAS AND RADIOACTIVE MATERIAL TO IONIZE THE GAS

Raymond Babigan, 4804 45th St. NW., Washington, D.C. 20016

Original No. 3,361,866, dated Jan. 2, 1968, Ser. No. 446,889, Apr. 9, 1965. Application for reissue Dec. 31, 1969, Ser. No. 889,754

Int. Cl. H01b *1/00, 5/00, 9/00*

U.S. Cl. 174—9 F **17 Claims**



A long distance electrical conductor comprises a metallic housing and a metallic wire within and spaced from the housing. A perforated metal member which may comprise an aluminum screen is positioned between the housing and wire. An ionizable gas may be included in the space between the housing and wire.

27,398

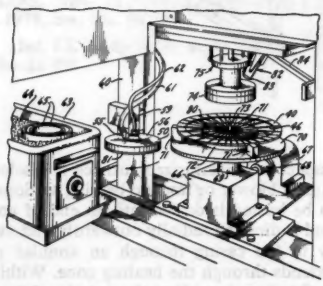
APPARATUS FOR FORMING WIRE CONTROL ELEMENTS

Maurice H. Brown, Palos Heights, Ill., assignor to Azonic Products Inc., Palos Heights, Ill.

Original No. 3,527,637, dated Sept. 8, 1970, Ser. No. 611,112, Jan. 23, 1967, which is a division of Ser. No. 347,725, Feb. 27, 1964. Application for reissue Oct. 7, 1970, Ser. No. 78,828

Int. Cl. B32b *31/18, 31/06*

U.S. Cl. 156—510 **5 Claims**



A wire impedance forming assembly wherein a turntable receives a first paper disc and the disc receives a sunburst-wound strand on a ring, a vacuum plate holds a second disc over an adhesive bath, an applicator element rises from the bath to apply adhesive to the second disc, a pressure nozzle on the plate is actuated to break any film of adhesive thus formed, the plate is pivoted over the turntable to place the second disc, adhesive side down, over the strand and first disc and a press moves onto the second disc to press the two discs and strand together as the turntable rotates, a cutter moving into the area adjacent the turntable to cut the strand from the ring.

27,399

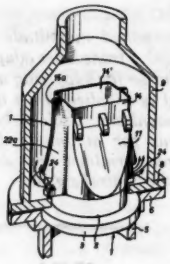
NONRETURN VALVES

Nicola D'Urso, Turin, Italy, assignor to A.M.I.S. Apparecchi E Macchine Idrauliche Speciali S.p.A., Turin, Italy

Original No. 3,556,138, dated Jan. 19, 1971, Ser. No. 748,801, July 30, 1968. Application for reissue May 19, 1971, Ser. No. 145,073

Int. Cl. F16k *15/00*

U.S. Cl. 137—512.15 **6 Claims**



A nonreturn valve for liquids has a tapered end formed by flexible inclined walls terminating in a slit which is defined between two flexible lips. A continuous raised rib is formed on the internal surface of one of the lips and makes linear sealing contact with a corresponding [force] *face* of the other lip inwardly of the slit effectively to cut off flow through the slit upon closure of the valve.

27,400

MOUNTING PEDESTAL FOR UTILITIES

Anne D. Nickola, Diane Trailer Park, 6–6255 N. Saginaw Road, Mount Morris, Mich. 48458

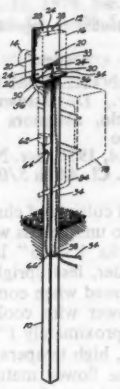
Original No. 3,502,785, dated Mar. 24, 1970, Ser. No. 684,199, Nov. 20, 1967. Application for reissue Dec. 3, 1970, Ser. No. 95,002

Int. Cl. H02g *9/00*

U.S. Cl. 317—99 **23 Claims**

A mounting pedestal adapted to support an electrical power box, an electric meter, a telephone box, a television jack, and a gas meter operatively in a compact arrangement for providing utility services to a mobile home. A hollow, rectangular metal post is supported in an upright position in the ground, extending thereabove, and supports an L-shaped mounting bracket on the top thereof. The bracket provides the means for supporting the power box and the meter with the telephone box, television jack

and gas meter carried by the post at positions below the bracket. A ground wire is disposed within the post to



connect the box, the bracket and meter to an underground grounding means.

27,401

CROSS-LINKED HYDROPHILIC POLYMERS AND ARTICLES MADE THEREFROM

Otto Wichterle, Prague, and Drahoslav Lim, Senohraby, near Ricany, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

No Drawing. Original No. 3,220,960, dated Nov. 30, 1965, Ser. No. 77,278, Dec. 21, 1960, which is a division of Ser. No. 580,410 and Ser. No. 580,411, both Apr. 24, 1956. Application for reissue Aug. 5, 1970, Ser. No. 61,522

Int. Cl. C08f *15/16*

U.S. Cl. 260—2.5 R **23 Claims**

A major portion of a monoester of acrylic or methacrylic acid with a bi-functional alcohol which has an esterifiable hydroxyl group and at least one additional hydrophilic functional group is copolymerized in aqueous solution with a small amount of a diester of these acids and of an alcohol which has at least two esterifiable hydroxyl groups until a shape retaining body is obtained.

27,402

APPARATUS FOR EXTRACTING STARCH AND GLUTEN FROM A DOUGH OF WHEAT FLOUR

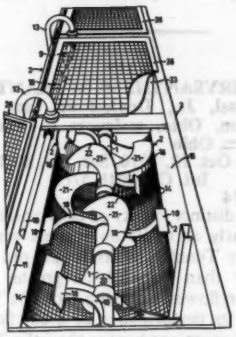
Erik Plaven, Scheelegatan 1, Stockholm, Sweden

Original No. 3,506,485, dated Apr. 14, 1970, Ser. No. 476,128, July 30, 1965. Application for reissue May 15, 1970, Ser. No. 37,578

Claims priority, application Sweden, Aug. 4, 1964, 9,412/64

Int. Cl. B03b *3/00, 11/00*; C13l *1/00*

U.S. Cl. 127—25 **7 Claims**



An apparatus for separating starch from and collecting gluten in a treating zone by repeatedly catching and pushing the gluten in the zone, lifting the lumps of collected gluten out of the zone, and dropping the lumps of gluten back to the treatment zone in an optionally repeated series *as by means of improved arrangements and forms of different pluralities of special treatment and working members within a tank-supported perforated trough into which a washing liquid is diffused and quickly drained away.*

PLANT PATENTS

GRANTED JUNE 20, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,211
EUONYMUS FORTUNEI SHRUB

M. Leslie Hancock, Cooksville, Ontario, Canada, assignor to Monrovia Nursery Company

Filed Oct. 12, 1970, Ser. No. 80,255
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—63 **1 Claim**

1. A new and distinct variety of *Euonymus fortunei* characterized by its compact growth and unusual range of foliage coloration, and by hardiness at below-freezing temperatures superior to plants most closely related to it.

3,212
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 12, 1970, Ser. No. 80,256
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct variety of chrysanthemum characterized particularly as to its uniqueness when compared with the cultivar Tuneful by its bright red bronze color which is darker than Tuneful, its greater resistance to fading, its larger flowers, ranging from ½" to 1" larger than Tuneful's, its performance as a cut flower where it is taller and far more productive than the Tuneful varieties, its performance as a pot mum where it establishes itself and is ready for pinching earlier thereby providing a more prolific, fuller pot plant with a greater responsiveness to growth regulators.

3,213
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 12, 1970, Ser. No. 80,258
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly in uniqueness when compared to the parent cultivar Sunstar by its clear, light shade of yellow color, with no bronze tinging when exposed to cool temperatures in the range of 52°–58°.

3,214
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 14, 1970, Ser. No. 80,822
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly to the uniqueness as compared with the parent cultivar Orange Bowl by its smaller flowers by approximately 1", more formal flowers, with fewer spooned petals, broader petals, more deeply keeled, deeper color, shorter habit, smaller, darker foliage, 30 percent more breaks, 3 days earlier and more uniform response, rudimentary stipules, and a year round flowering period in the north and northwest.

3,215
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 14, 1970, Ser. No. 80,823
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to uniqueness when compared to the cultivar Neptune, by its 1"–1½" larger flowers, petals approximately ¾" wider, less upright growth habit with about 3" additional spread when comparing single plants, non-pinking of the flower with cool finish of 60° F. or less, lighter foliage, approximately 1" longer leaves, flatter petal during high light, high temperature periods, with no longitudinal roll as the flower matures providing a less aged appearance, greater spread, one week later response, and its 3" more vigor when both grown under the same long day treatment.

3,216
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 14, 1970, Ser. No. 80,824
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to uniqueness in comparison with the parent cultivar Stingray, by its lighter, more orange-bronze color, a two to three day earlier response period, and a more uniform response within a flowering block.

3,217
PEACH TREE

Lester P. Pratt, Wenatchee, Wash., assignor to Van Well Nursery, Inc., Wenatchee, Wash.

Filed Nov. 16, 1970, Ser. No. 90,163
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—43 **1 Claim**

As a mutation of Redhaven, a new peach tree variety is disclosed which is characterized by its semidwarf nature and the vigorous growth of the lateral buds near the base of its terminal shoots.

3,218
CHRYSANTHEMUM PLANT

Paul A. Vogel, Encinitas, Calif., assignor to Manatee, Incorporated, Encinitas, Calif.

Filed Nov. 19, 1970, Ser. No. 91,228
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—82 **1 Claim**

1. A new and distinct variety of chrysanthemum plant of the incurved type, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a straight, upright, strong and free habit of growth, a large flower size, a distinctive and attractive flower color generally corresponding to near Chianti Antique Ruby on the inside of the petals and near Martius Yellow on the reverse side of the petals, good hardiness, both outdoors and in the greenhouse, and a suitablity for year around blooming in southern latitudes.

3,219

DRACAENA CELES

Charles Frederick Pennock, San Juan, Puerto Rico, assignor to Cerro Gordo Nursery, Inc., Durado, Puerto Rico

Filed Dec. 16, 1970, Ser. No. 98,969
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 1 Claim

1. The new and distinct variety of Dracaena plant substantially as herein shown and described, characterized particularly by small narrow lanceloate leaves, including the prominent petiole, the leaves being compactly grouped and erect, the texture thereof being hard and the leaves regularly spaced along the full length of the cane and the distinctive color pattern of its leaves with a narrow striping thereof represented by a single, narrow whitist marginal stripe, lengthwise through the center and margined with dark green on the upper surface and gray green on the bottom surface.

PATENTS

GRANTED JUNE 20, 1972

GENERAL AND MECHANICAL

3,670,339

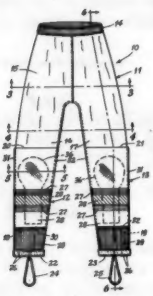
HOCKEY UNIFORM GARMENT

Barbara T. Cooper, 4 Benwood, St. Louis, Mo.; Lynn F. Polak, 31 Bon Hills Drive, St. Louis, Mo., and Penny W. Kodner, 57 Pricewoods Lane, St. Louis, Mo.

Filed Dec. 28, 1970, Ser. No. 101,600

Int. Cl. A41d *13/06*

U.S. Cl. 2—22 **6 Claims**



An athletic uniform garment integrating socks with underpants and eliminating separate socks held up by garter belts. Knee and shin guard pockets in the integrated garment.

3,670,340

COMBINED BELT AND SKI JACKET

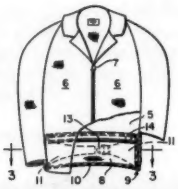
Marvin Walker, Hampstead P. Q., Canada, assignor to Ski-Doo Sports Ltd., Montreal, Quebec, Canada

Filed Nov. 25, 1970, Ser. No. 92,688

Claims priority, application Canada, Nov. 27, 1969, 068,567

Int. Cl. A41d *1/00, 27/20*

U.S. Cl. 2—93 **3 Claims**



This invention relates to a garment of the type which folds away into a pocket of the garment to form a collapsed package. Garments of this type are insufficient in that they are still relatively bulky when in the collapsed or carrying state and cannot be readily pocketed, when not in use, by the person carrying it. The garment of the present invention comprises, in its wearing mode, a back panel, a pocket panel secured to the back panel along two opposing seams and a third seam to form a pocket. The garment is rolled and the pocket everted so that it is contained in the pocket in the carrying mode. By providing a body-encircling strap attached to the interior of the pocket in the wearing mode which is thus exterior in the everted position, the user may secure the garment in its carrying position about his waist thereby leaving his hands free for other tasks.

3,670,341

FLUID PRESSURE CONTROL DEVICE FOR AN ARTIFICIAL LEG

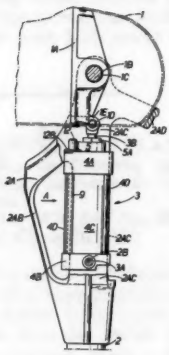
Frank Allan Webb, Farnham, and John Jeffrey Shorter, East Oakley, both of England, assignors to Chas. A. Blatchford & Sons Limited, Hampshire, England

Filed Dec. 1, 1969, Ser. No. 881,100

Claims priority, application Great Britain, Dec. 2, 1968, 57,061/68

Int. Cl. A61f *1/00, 1/08*

U.S. Cl. 3—1.2 **7 Claims**



A fluid pressure control device has a piston and cylinder. The cylinder includes a cylindrical wall and a pair of end parts. The piston rod extends slidably through one end part, which end part is adjustably axially movable for varying the piston stroke length. The device is of especial interest in the control of flexion and extension motions of an artificial leg.

3,670,342

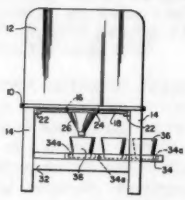
CHAIR FOR MEASURING URINARY FLOW RATE

David T. Mahony, c/o Mahony Urology Assc., Inc., 966 Park Street, Stoughton, Mass.

Filed March 10, 1971, Ser. No. 122,922

Int. Cl. A47k *11/04*; A61g *7/02*

U.S. Cl. 4—134 **6 Claims**



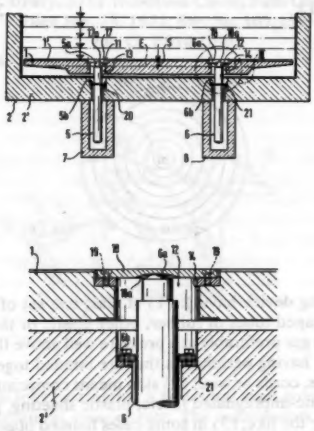
A chair for measuring a patient's urinary flow rate has an opening in the seat on which the patient sits. The opening is

elongated in the front to back direction. A funnel is mounted on tracks directly below the opening so that it can be moved forwardly or rearwardly with respect to the opening to suit the particular patient. A tray is situated directly below the seat. The tray is movable from side-to-side and is also adjustable on runners forwardly and rearwardly so that the midplane of the tray can be adjusted to correspond to the position of the funnel. A transverse array of compartments or depressions are formed in the tray to retain containers. By moving the tray sideways, then, the containers can be moved, in turn, past the funnel for the collection of a succession of voided fluid specimens.

ERRATUM

For Class 4—236 see:
Patent No. 3,670,441

3,670,343
SWIMMING POOL CONSTRUCTION
Emil Gansloser, Grazer Strasse 26, Hannover, Germany
Filed June 16, 1970, Ser. No. 46,645
Claims priority, application Germany, June 25, 1969, G 69 25 223.9
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172.13 **8 Claims**



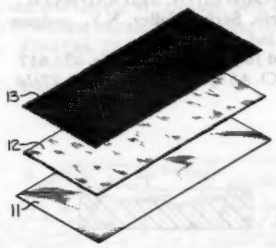
An adjustable swimming pool having a floor which can be raised and lowered to either provide a uniform depth or a variable depth. Jacks are distributed beneath a platform constituting the apparent bottom of the pool and are arranged for operation in unison or in groups to adjust the platform position and attitude.

3,670,344
HEIGHT-ADJUSTABLE CRIB
Alban M. Boudreau, Bedford, Pa., assignor to Hedstrom Company, Bedford, Pa.
Filed Jan. 6, 1971, Ser. No. 104,283
Int. Cl. A47c 7/03, 17/14
U.S. Cl. 5—11 **2 Claims**

A height-adjustable crib has four legs composed of upper and lower sections. A laterally extending screw and pin are spaced apart on one section. These engage in adjacent holes spaced along the length of the other leg section. The pin extends only part way through the other section, while the screw extends all the way through so that a nut can be turned down on the screw to lock the two sections together. An end hole in the lower section is arranged so that it can only receive the pin

in order to ensure that there is always a two-point connection between the two leg sections.

3,670,345
PATIENT UNDERPAD
Martin Doll, and Frank Von Drehle, both of Patterson, N.C., assignors to Cellu Products Company, Patterson, N.C.
Filed Feb. 2, 1970, Ser. No. 7,442
Int. Cl. A61g 7/04
U.S. Cl. 5—91 **10 Claims**

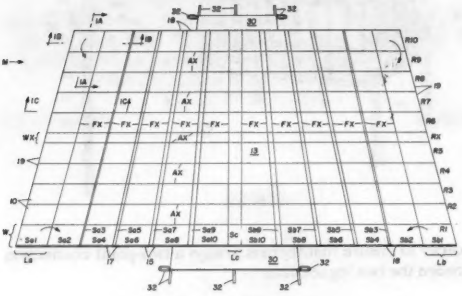


A patient underpad characterized in its ability to provide cushioning for a patient and to readily absorb large volumes of liquid in a manner such that the liquid absorbed does not thereafter irritate the patient. The underpad includes a moisture-impervious bottom layer, a moisture-absorbing layer covering the bottom layer and a closed cell, expanded thermoplastic top layer covering the moisture-absorbing layer and having perforations or openings therethrough of sufficient number and size to permit liquids, such as body excretions, to freely pass therethrough to be absorbed by the moisture-absorbing layer while supporting the patient in spaced relation from the liquid absorbed by the moisture-absorbing layer.

3,670,346
MAT FOR FREE EXERCISE AND THE LIKE
George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation, Cedar Rapids, Iowa
Filed March 4, 1971, Ser. No. 120,935
Int. Cl. A47g 9/00
U.S. Cl. 5—344 **16 Claims**

A large rectangular floor mat having an integral cover providing a substantially smooth, unbroken top surface is constructed in the form of individual sections permanently connected together only by an overall top sheet constituting a part of the cover and arranged so that the entire mat can be readily "roll-folded" inwardly from its two ends to form a long narrow stack of mat sections on the floor which can then be moved

away to one side, all without requiring any disassembly of the mat. A separate sheet or "skid" beneath the mat is also provided so that after the mat is folded the skid can serve as a handy means by which the folded mat can be dragged across

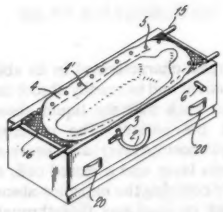


the floor. Additionally, the mat is constructed so that it can also be folded inwardly from its sides in order readily to remove shock absorbing material within the mat sections without requiring any disassembly of the cover.

3,670,347
THERAPEUTIC BED AND BATH

Bernard Weinstein, Spring Valley, N.Y., assignor to DePuy, Inc., Warsaw, Ind.

Filed July 26, 1965, Ser. No. 474,617
Int. Cl. A61g 7/10; A47c 27/08, 27/18
U.S. Cl. 5—348 **8 Claims**



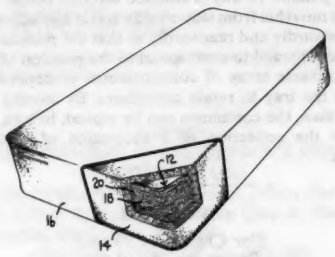
A bed for reducing the effective weight of a body is disclosed having a cavity contoured to the approximate shape of the body of a person to occupy the bed. The bed includes a fluid within the cavity and may have a fluid impervious sheet draped over the cavity upon which the person lies and is floated.

3,670,348
RESILIENT, FIRE-RESISTANT ARTICLE

Winfield T. Irwin, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 13, 1968, Ser. No. 728,490
Int. Cl. A47c 23/00; B29h 17/28
U.S. Cl. 5—345 **1 Claim**

This relates to a safety mattress, pillow, cushion, upholstered article and the like, comprising a layer of flexible sheet material covering an incombustible, resilient, low-bulk, high-density mass of interlocked segments of fiber glass filaments that are free of organic binder and have a permanently

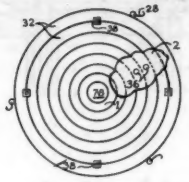


distorted shape extending in a plurality of directions when said filaments are substantially free of tension.

3,670,349
LIGHT WEIGHT ARTICLE

Alvin E. Moore, 916 Beach Boulevard, Waveland, Miss.

Continuation-in-part of Ser. No. 531,564, March 3, 1966, Pat. No. 3,503,825. This application March 30, 1970, Ser. No. 23,789
Int. Cl. B63c 9/30
U.S. Cl. 9—12 **32 Claims**



A lifesaving device having: (1) at least one set of flatwise, doughnut-shaped tubes of rubber, other plastic or thin metal, inflated with gas preferably at a pressure well above that of the atmosphere, having peripheries that are bonded together and tied by bands, cords or wire; (2) skin means comprising joined skins of plastic-impregnated fabric, plastic sheeting, plywood, thin metal or the like; (3) in some cases foamed plastic within the doughnut-shaped holes; (4) optionally, helium balloons in the foamed plastic; and, where the device serves as an article of furniture (table, chair or bed) until its use in life-preserving, (5) lower framework, comprising stacked doughnut-shaped tubes and a survival-kit storage container in this framework. The article of furniture may be inverted and floated as a life preserver. The structure of the invention also may be used as a life buoy or other buoy, a floatable mattress or part of a boat.

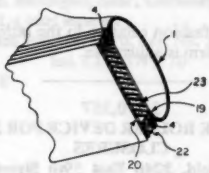
3,670,350
FOOTWEAR

Curt E. Kaufman, Waynesville, N.C., assignor to Ro-Search, Incorporated, Waynesville, N.C.

Division of Ser. No. 846,019, July 30, 1969, Pat. No. 3,577,858, and a continuation-in-part of Ser. No. 794,333, Jan. 27, 1969, Pat. No. 3,562,930, which is a division of Ser. No. 521,247, Jan. 14, 1966, Pat. No. 3,473,178. This application April 22, 1970, Ser. No. 38,634
Int. Cl. A43d 9/00
U.S. Cl. 12—142 RS **1 Claim**

Footwear such as shoes, boots, etc. having a welt at its lower margin to which a prepared sole, usually of sheet stock, is fastened having a ribbon of elastomeric material molded and

cured in situ along the inner perimeter of the welt so as to provide a stepless transition inside of the shoe from the upper to the sole. Such shoes having soles of soft material, such as micro-cellular elastomer, and also a stabilizing insert and the ribbon of elastomer is molded to secure the insert in its desired location to provide the stepless transition from the inside of



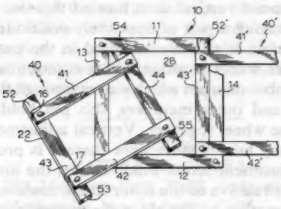
the upper to the sole. The method of manufacture of such footwear by holding the pre-welted upper under tension on the last of a sole laying device until after closing of the side frame of said device so that by releasing said tension, the welt is forced into sealing engagement with the side wall of said side frame.

3,670,351

STRUCTURAL SPAN

William R. Drury, 3716 Woodland Circle, Falls Church, Va.

Filed Jan. 18, 1971, Ser. No. 107,159
Int. Cl. E01d *1/00*
U.S. Cl. 14—1 **9 Claims**



A system for constructing a structural span comprising two types of structural components. The components of the first type each comprise a pair of first longitudinal members parallel to each other, and a pair of first transverse members connected to the bottom of the first longitudinal members. The components of the second type each comprise a pair of second longitudinal members parallel to each other and spaced to lie inside of and parallel to the first longitudinal members; and a pair of second transverse members connected to the bottom of the second longitudinal members. The second transverse members are adapted to extend underneath the first longitudinal members. The first longitudinal members and the first transverse members define an opening of a size to permit the passage of the second transverse members of each of two structural components of the second type in order to permit assembly of the span from its components.

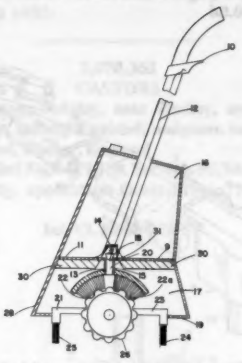
3,670,352

FOAM GENERATING FLOOR CLEANSING DEVICE

Earnest Robert Ballantyne, Columbus, Ohio, assignor to Ballantyne Manufacturing Company, Columbus, Ohio

Filed Sept. 11, 1970, Ser. No. 71,298
Int. Cl. A47l *13/12*
U.S. Cl. 15—4 **8 Claims**

A floor covering cleansing device manually or electrically operable of the detergent foam generating type and specifically a corrugated roller in engagement with a brush for



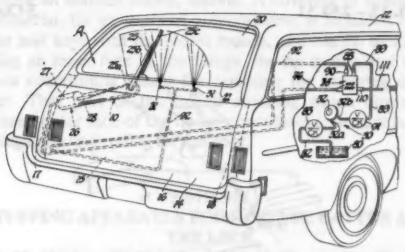
generating the foam. The corrugated roller and other brushes are further utilized to work the foam into the floor covering.

3,670,353

DEMAND VACUUM ACTUATED TAILGATE WIPER SYSTEM

Loren R. Gute, and George W. Jackson, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1970, Ser. No. 84,310
Int. Cl. B60s *1/02*
U.S. Cl. 15—250.02 **9 Claims**



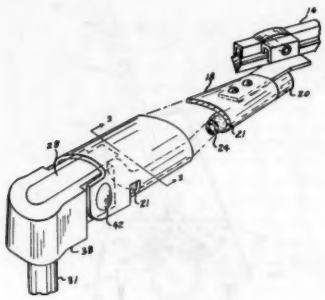
In a preferred form, this disclosure relates to a window cleaning system for cleaning a tailgate window of a station wagon vehicle. The window cleaning system includes a wiper unit having a window wiper which is supported by the tailgate for oscillatory movement across the outer surface of the window through inboard and outboard strokes and a drive means for moving the wiper through its strokes. The drive means includes a fluid motor for moving the wiper through its outboard stroke when fluid pressure is communicated thereto and a spring means for moving the wiper through its inboard stroke when fluid pressure is not communicated to the fluid motor. The window cleaning system also includes a washer unit having a washer nozzle for directing the washer fluid against the window and a manually actuatable pump means for delivering washer fluid under pressure to the washer nozzle. The window cleaning system further includes a coordinator means which is responsive to pressurized fluid being delivered by the pump means to cause a source of fluid pressure to be communicated to the fluid motor whereby actuation of the pump means causes the wiper to be actuated through its outboard stroke and washer fluid to be squirted against the window.

3,670,354

LOW PROFILE WIPER-WASHER ASSEMBLY

Alexander F. Weber, 6310 Marshall Road, Centerville, Ohio

Filed Dec. 16, 1970, Ser. No. 98,643
Int. Cl. B60s *1/46*
U.S. Cl. 15—250.04 **1 Claim**



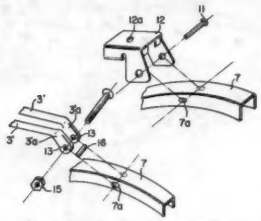
A windshield washer and wiper assembly having a hollow drive shaft for the wiper arm with fluid for the windshield being supplied through the shaft to a fluid transmission element. A tubular member connected to the fluid transmission element passes through the windshield wiper arm to a nozzle. A substantially circular shaped channel is provided in the windshield wiper arm to retain the tubular element within the wiper arm.

3,670,355

WIPER ASSEMBLY FOR VEHICLES

Kashira Sakamoto, 12, Tennocho-7-chome, Kariya, Japan

Filed Feb. 4, 1971, Ser. No. 112,677
Claims priority, application Japan, March 23, 1970, 45/27738
Int. Cl. B60s *1/40*
U.S. Cl. 15—250.32 **3 Claims**



A wiper assembly in which an arm piece consisting of two rods combined with each other, and a blade element are pivotably connected with each other by means of a pivot pin extending through holes formed in the flat portions at the end extremities of said rods and holes formed in a connector for attaching said blade element to said arm piece.

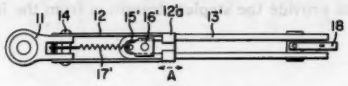
3,670,356

WIPER ARMS

Kashira Sakamoto, 12, Tennocho-7-chome, Kariya-shi, Japan

Filed Feb. 4, 1971, Ser. No. 112,675
Claims priority, application Japan, March 19, 1970, 45/26406; March 19, 1970, 45/26407
Int. Cl. B60s *1/32*
U.S. Cl. 15—250.35 **3 Claims**

A wiper arm in which a wiper arm consisting of a U-shaped rod is secured to a retainer at the U-shaped end and also at the two rod sections thereof. The U-shaped end of the wiper arm is secured to the retainer in the detachable fashion, while the two rod sections thereof are secured to the retainer in the lon-



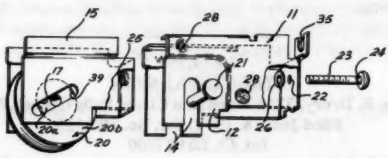
gitudinally slidable fashion relative to the latter, whereby the length of the wiper arm is adjustable.

3,670,357

ADJUSTABLE ROLLER DEVICE FOR SLIDING CLOSURES

Joseph F. Steigerwald, 3240 East 59th Street, Long Beach, Calif.

Continuation-in-part of Ser. No. 484,065, Aug. 31, 1965, abandoned. This application June 10, 1970, Ser. No. 44,993
Int. Cl. E05d *13/02*
U.S. Cl. 16—105 **2 Claims**



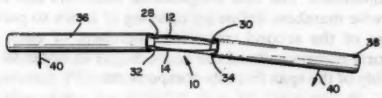
A stationary outer frame member is attached to the bottom portion of a sliding closure, this outer frame having a pair of oppositely positioned vertical slots formed therein. An inner frame member having a pair of oppositely positioned canted slots formed therein is slidably mounted in the outer frame member. A roller wheel is mounted for rotation within the inner frame member on a pin which passes through the slots of both the inner and outer members, this pin holding these members and the wheel together. Vertical adjustment of the wheel without any lateral movement thereof is provided by means of an adjustment screw which causes the inner frame member to move relative to the outer frame member thereby causing vertical motion on the pin in the vertical slots formed in the outer frame member.

3,670,358

SELF ACTUATING SELF LOCKING FLEXIBLE HINGE

Seymour S. Schwartz, and Charles P. Rubin, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed April 29, 1970, Ser. No. 32,945
Int. Cl. E05d *7/11*
U.S. Cl. 16—150 **3 Claims**



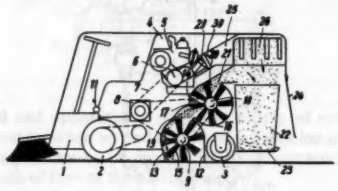
The hinge is capable of twisting and bending about at least two axes and comprises a pair of strips having a transverse curvature. The strips are secured at their ends to a pair of rigid tubes, beam parts, supports, and the like, which are thereby joined together. The strips are preferably mounted facing one another with their centers of curvature lying inward. In bend-

ing the hinge, the strips are caused to flatten out and the inner strip is compressed thus developing the actuation force. Rubber pads or the like may be placed between the metal strips in order to increase the stored spring energy and to improve the hinge's folding characteristics.

3,670,359
FLOOR SWEEPING APPARATUS

Walter Gutbrod, Bubingen, Saar, Germany, assignor to Wolfgand Gutbrod, a part interest

Filed Feb. 11, 1970, Ser. No. 10,489
Int. Cl. A47l 9/10
U.S. Cl. 15—348 **6 Claims**

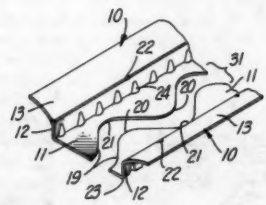


A sweeping apparatus driven by a fuel burning engine, the sweeping mechanism including first and second counter-rotating brushes, the first and lower brush being in contact with the surface to be swept and rotating counter to the direction of travel and the second brush being mounted above and to the rear of the first brush in a direction away from the direction of travel. The apparatus includes housing elements for enclosing the two counter-rotating brushes and a blower driven by the engine for directing suction air, from the surface being swept, upwardly through the two brushes to a filter element disposed immediately above a container for collecting the swept up debris. The finer dust particles are collected by the filter and subsequently drop into the container and the heavier dust particles are guided directly into the container.

3,670,360
CARPET BINDER BAR

Harvey J. Hill, Monterey Park, Calif., assignor to Roberts Consolidated Industries, Inc., Industry, Calif.

Filed June 15, 1970, Ser. No. 46,019
Int. Cl. A47g 27/04
U.S. Cl. 16—16 **10 Claims**

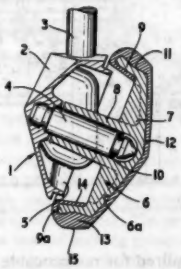


A concealed carpet binder bar used in conjunction with a tackless carpet strip for securing and concealing the raw edge of a carpet. The bar has a horizontal base portion, a substantially vertical portion upwardly extending from the inner edge of the base portion, the vertical portion being embossed with a plurality of vertical gussets along the length of the bar, each gusset extending from the inner edge of the base portion, and a flange portion laterally extending from the upper edge of the vertical portion. The carpet is anchored on the tackless strip, the edge is folded around the outer edge of the flange portion, and the flange portion is bent downwardly to secure and conceal the carpet edge. In another embodiment of the bar, the outer edge of the base portion is scalloped to provide alternating areas of maximum width and minimum width. In still another embodiment of the bar, the flange portion is convexly curved across its width.

3,670,361
CASTORS

Harry Brassington, Sedgley, near Dudley, and Jack Ralph Aston, Dudley, both of England, assignors to Joseph Gillott & Sons Limited, Dudley, England

Filed Nov. 4, 1970, Ser. No. 86,744
Claims priority, application Great Britain, Nov. 15, 1969, 56,033/69
Int. Cl. B60b 33/00
U.S. Cl. 16—18 **2 Claims**

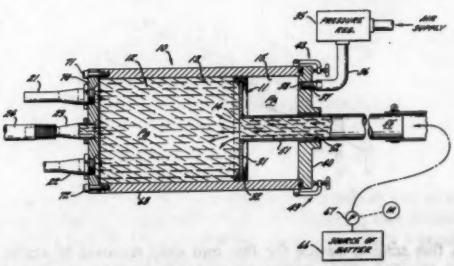


The invention relates to a furniture or like castor comprising a body part rotatable about a vertical axis, and a metal roller which is pivotally mounted upon the body part in a position to one side of the latter and which has a peripheral rear flange having an outer face provided with recess means, for example an annular recess, therein. A covering of non-metallic material, for example of polyurethane, is moulded on the roller and keys with the recess means, and has lip means engaging an inner face of the flange, the lip means and recess means constituting means for retaining the covering on the roller. That part of the lipped covering which covers the recessed outer face of the flange constitutes a contact surface for engaging and rolling on the floor.

3,670,362
STUFFING APPARATUS FOR SAUSAGE BATTER AND THE LIKE

Alvin W. Hughes, 4N 194 Church Road, Bensenville, Ill.

Filed Nov. 18, 1970, Ser. No. 90,495
Int. Cl. A22c 11/06
U.S. Cl. 17—39 **5 Claims**



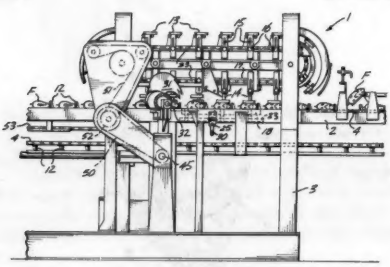
Improved apparatus for continuously stuffing sausage batter, or a like substance, at a uniform rate of discharge into

casings. In the illustrative embodiment, a single cylinder and piston arrangement maintains a constant pressure upon the sausage batter within the cylinder by means of controlled fluid pressure upon the piston with the sausage batter entering the cylinder continuously through an aperture in the piston and at a pressure approximately equal to that acting upon the piston.

3,670,363
FISH-BEHEADING AND CLEANING APPARATUS

Elmer R. Hogan, Bellevue, and John I. Simpson, Seattle, both of Wash., assignors to Smith-Berger Manufacturing Corporation, Seattle, Wash.

Filed March 13, 1970, Ser. No. 19,162
Int. Cl. A22c *25/08*
U.S. Cl. 17—55 **4 Claims**

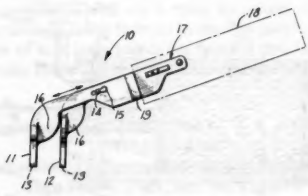


The stroke required for reciprocable hold-downs on a beheading table is reduced by providing auxiliary rails for elevating smaller fish, and the fish are moved along the feed table by fabricated angle flight links. A tail-receiver lifted by a cam wheel rotating about a horizontal axis transfers the fish from the feed table to tail-impaling pins of the fish-cleaning bull wheel. In a common drive for the bull wheel and the beheading table an automatic satellite gear train throw-out will disengage a holding lever to disconnect the drive for the means feeding the cleaning mechanism if such feeding means becomes overloaded. A parallel-link control maintains the belly-fin cutter in proper angular relationship to the bull wheel and a more direct and simplified drive arrangement is provided for the rotary cleaning scrapers and brushes alongside the bull wheel.

3,670,364
ELECTRICAL FISH SCALER

George M. Bradley, 3451 Hanover Drive, Kent, Ohio

Filed May 21, 1970, Ser. No. 39,413
Int. Cl. A22c *25/02*
U.S. Cl. 17—66 **1 Claim**

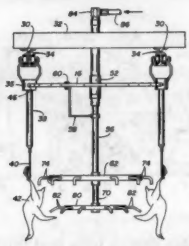


A fish scaling device for fast and easy removal of scales from the fish. This device incorporates a pair of toothed blades which slide against each other in an oscelating fashion. The device includes also a handle which will contain a battery and motor for the operation of the blades or the handle will have cord means and plug means for plugging it into an electrical outlet.

3,670,365
SYNCHRONIZED PIN POINT SPRAY FLUID APPLICATOR

Janus J. Dillon, Irving, Tex., assignor to Food Equipment, Inc., Dallas, Tex.

Filed June 15, 1970, Ser. No. 46,263
Int. Cl. A22c *21/04*
U.S. Cl. 17—11.2 **12 Claims**

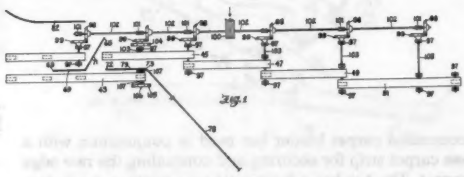


In a vaporizing spray system for the treatment of slaughtered animals, a synchronized fluid applicator is located at a curved portion or turning point of a conveyor utilized therewith. The fluid applicator has spaced nozzles for delivering a fluid stream upon a preselected localized portion of an animal carried by the conveyor. The nozzles are mounted, preferably in a circular pattern, and synchronized with the motion of the conveyor to travel along the path of the animal being conveyed around the curved portion of the path, thus applying a fluid such as steam to a portion of the animal.

3,670,366
AUTOMATIC STRIPPING MACHINE FOR ABACA AND ALLIED FIBER BEARING PLANTS

Juan T. Villanueva, and Jesus T. Villanueva, both of 105 Apo Street, Sta Mesa Heights, Quezon City, Philippines

Filed June 4, 1969, Ser. No. 830,449
Claims priority, application Philippines, June 4, 1968, 9282
Int. Cl. D01b *1/10*
U.S. Cl. 19—12 **9 Claims**

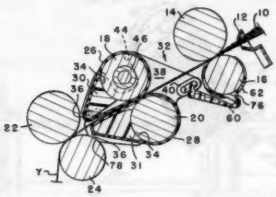


A method and apparatus for defibering sheaths of fibrous material, particularly Manila hemp, by conveying the sheaths past several stationary blades arranged in the path of travel of the sheaths whereby the edges of the blades separate the fibrous parts of the sheaths from the pulpy parts.

3,670,367
DRAFTING APPARATUS

Robert M. Ingham, Jr., Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 809,867, March 24, 1969. This application April 2, 1970, Ser. No. 29,362
Int. Cl. D01h 5/88
U.S. Cl. 19—255 12 Claims

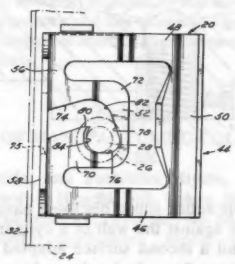


Method and apparatus to stop the supply of roving to a drafting system when an end breaks to prevent lap damage to the drafting system by physically rotating a serrated member into the path of flow of the roving supply.

3,670,368
FASTENER

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Warren Division, Mount Clemens, Mich.

Filed May 6, 1970, Ser. No. 35,056
Int. Cl. A44b 21/00
U.S. Cl. 24—73 2 Claims



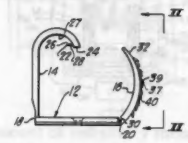
A fastener or adapter for attaching a molding member or the like to a panel surface having a headed button upstanding therefrom, comprising a panel engaging body having means for retaining the molding member tensioned against the panel and an inclined ramp tensioned against the underside of the button head, with a slot in the ramp accommodating the button shank and having a seat portion spaced laterally from the slot axis to prevent dislodgment of the fastener from the button once the molding is assembled on the fastener. An arcuately shaped edge on the slot serves to cam the button into the slot seat as the fastener is slid onto the button.

3,670,369
ADJUSTABLE CLAMP FOR ELONGATED ARTICLES WITH TRANSVERSE LOCKING MEANS

Peter McIlroy, II, Pittsburgh, Pa., assignor to Robroy Industries, Verona, Pa.

Filed March 9, 1971, Ser. No. 122,352
Int. Cl. B65d 63/00
U.S. Cl. 24—16 PB 5 Claims

A releasable clamp for securing elongated objects such as wires to a supporting structure that includes a substantially rigid base member, a substantially rigid inverted J-shaped locking member and a deformable tab member. The J-shaped locking member and deformable tab member extend upwardly from the end portions of the base member and have cooperating locking means thereon. The locking means includes an inwardly extending projection adjacent the free end portion of the J-shaped locking member and a plurality of transversely extending spaced locking projections on the outer surface of the deformable tab member. The inwardly extending projection of the J-shaped locking member is adapted to engage one of the spaced locking projections on the deformable tab

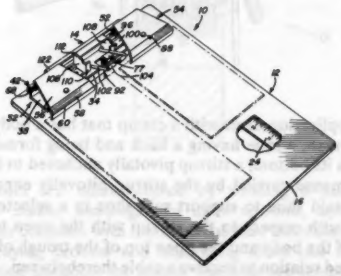


member. The projections on the tab member have a generally triangular configuration in cross-section with a vertical locking shoulder and an adjacent inclined face. The transverse locking means includes a plurality of protuberances projecting upwardly from the tab member on opposite ends of each spaced projection on the tab member. The protuberances are positioned between the spaced locking projections so that the inwardly extending projection of the J-shaped locking member, when engaged to the vertical locking shoulder of a locking projection on the tab member, is restrained from transverse movement by the upwardly extending protuberances.

3,670,370
CLIP BOARD WITH PENCIL HOLDER

Charles M. Goodwin, Route 2, Mount Vernon, Ohio

Division of Ser. No. 705,984, Feb. 16, 1968, abandoned. This application March 13, 1971, Ser. No. 120,678
Int. Cl. A44b 21/00; B42f 1/02
U.S. Cl. 24—67.7 7 Claims



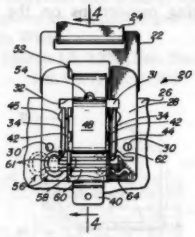
A clip board comprising a clamping unit affixed to one end of an enlarged rectangular board. The clamping unit includes a pair of laterally spaced pressure arms individually operable or simultaneously operable at the option of the user of the clip board for the releasable clamping of sheets of paper or the like to the board. Each pressure member is operated through its individual lift arm against the action of a spring resiliently biasing the pressure member closed.

3,670,371

CATCH WITH ANTI-RELEASE LATCH

Gunnar E. Swanson, Middletown, Conn., assignor to The Nielsen Hardware Corporation, Hartford, Conn.

Continuation of Ser. No. 790,130, Jan. 9, 1969, abandoned.
This application Feb. 24, 1971, Ser. No. 118,552
Int. Cl. A43c 11/00
U.S. Cl. 24—68 T 22 Claims



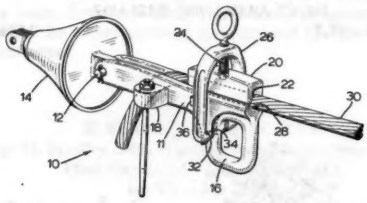
A catch for releasably connecting two separable parts and having a base adapted for attachment to one part and an operating lever operable to move a latch into engagement with a strike attached to the other part. A manually releasable resilient generally U-shaped locking element acts between the operating lever and another part of the catch to automatically lock and releasably retain the catch in its closed or strike engaging position when the catch is moved to the latter position.

3,670,372

CABLE CLAMP

Noble W. Crosby, Trenton; Robert C. Walker, Newmarket, and Gordon J. Clarke, Bramalea, all of Ontario, Canada, assignors to Local Industries Limited, Newmarket, Ontario, Canada

Filed July 9, 1970, Ser. No. 53,472
Int. Cl. F16g 11/06
U.S. Cl. 24—125 N 2 Claims



This application deals with a clamp that has a body formed with a trough, a shoe having a back and being formed with a trough on its bottom, a stirrup pivotally anchored to the body, support means carried by the stirrup pitovally engaging the back of said shoe to support said shoe in a selected spaced relation with respect to the stirrup with the open top of the trough of the body and the open top of the trough of the shoe in opposed relation to receive a cable therebetween.

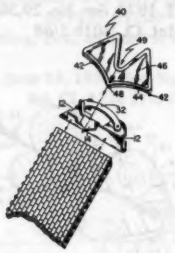
3,670,373

BRACELET CONNECTOR

Morris D. Gandelman, East Providence, R.I., assignor to Pale Corporation, Providence, R.I.

Filed Jan. 26, 1971, Ser. No. 109,862
Int. Cl. A44c 5/18; A43c 11/08
U.S. Cl. 24—265 SH 9 Claims

A connector, for coupling the end of a bracelet to another member, comprising a base member and a latching arm mounted thereupon, the base member being formed from stamped sheet metal and including a floor having an end portion which is upwardly bent from the remainder of said floor,



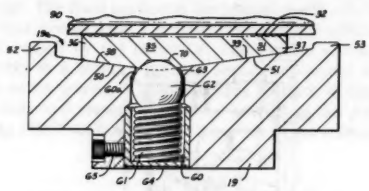
the latching arm being pivotally mounted upon a wall portion of the base member and having retaining means, which, in an operative position of the arm, is resiliently engaged with the end portion of the floor.

3,670,374

DOUBLE ACTING SLIPS

Thomas J. Hayes, Jr., Houston, Tex., assignor to Anbeck Corporation, Houston, Tex.

Filed June 8, 1970, Ser. No. 44,384
Int. Cl. E21b 19/06
U.S. Cl. 24—263 DA 11 Claims



A unitary, double acting slip is disclosed having a first surface adapted to fit against the wall of a cylindrical member, such as a pipe, and a second surface adapted to be forced against the adjacent surface of a bowl member so that the slip is wedged between the cylindrical member and the bowl after limited movement of the pipe. The second surface of the double acting slip has a thicker section intermediate its length and tapers from the thickest section to the ends of the slip thereby forming two tapered wedging areas. The second surface of the double acting slip may include a recess and the bowl may have a radial opening extending to the slip. A bearing member may be resiliently mounted in this opening to engage the recess in the second surface of the slip in order to aid in alignment of the slip.

3,670,375

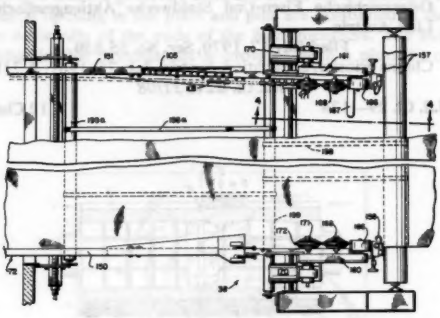
APPARATUS AND METHOD FOR TENTER PROCESSING OF OPEN WIDTH FABRIC

Eugene Cohn, Great Neck; Andrew P. Cecere, Valley Stream, and Robert Frezza, Carle Place, all of N.Y., assignors to Samcoe Holding Corporation, Woodside, N.Y.

Division of Ser. No. 698,899, Jan. 18, 1968, Pat. No. 3,551,970. This application Sept. 1, 1970, Ser. No. 68,646
Int. Cl. D06c 3/02
U.S. Cl. 26—57 A 6 Claims

The invention is directed to a fabric tenter apparatus and related method, intended especially for the processing of

geometrically distortable fabrics in flat, open width form. The apparatus includes opposing sets of tenter chains for engaging the fabric margins, and the chains are divergently related at the entry end section and arranged in parallel relation along a processing section located downstream of the entry end. Means are provided for overfeeding of the fabric edge margins onto the tenter chains at the entry end. Additionally, as a unique feature of the combination, controllably driven web-supporting elements (e.g., tapes) are provided to support the center portions of the fabric web. These web-supporting elements engage the web commencing at a point upstream of the entry end section and extending well downstream therefrom, usually well into the processing section of the tenter. The supporting elements are driven at a controlled "overfeeding" or an "underfeeding" rate, so that the center portions of the fabric continue to be advanced at the controlled rate even after the fabric has been engaged by the slower moving tenter chains. The apparatus and the related process provide for an advantageous degree of control over the geometry of the cross lines of the fabric.



3,670,376

METHOD OF MANUFACTURING COLOR PICTURE TUBE

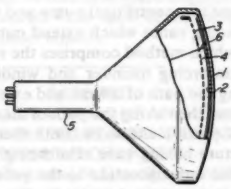
Atsuyoshi Uchida, and Yoshihiko Miyata, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 27, 1970, Ser. No. 84,272

Claims priority, application Japan, Dec. 24, 1969, 44/103372

Int. Cl. H01j *9/00*

U.S. Cl. 29—25.17 **19 Claims**



A method of manufacturing color picture tubes, comprising the steps of forming resinous lenses in openings or electron-beam permeating apertures of a color selective electrode of the color picture tube, exposing to light through this color selective electrode a phosphor screen formed on the inner surface of a face plate in a panel portion of said tube, and removing said resin-made lenses after the exposure step.

3,670,377

METHOD OF MANUFACTURING AN ELECTRIC LAMP FILAMENT HAVING A COILED-COIL BODY PORTION WITH ORIENTED OFF-SET LEGS

Jacob F. Michael, Paramus, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 648,430, June 23, 1967, Pat. No. 3,588,579. This application May 12, 1970, Ser. No. 36,601

Int. Cl. H01j *9/16, 9/44*

U.S. Cl. 29—25.18 **3 Claims**

A coiled-coil filament of refractory metal wire having longitudinally depending legs at each end that are joined to the coil barrel by open primary turns which are permanently bent through predetermined angles. The filament is initially wound as a continuous coil and, after the second coiling operation has been completed and the primary and secondary mandrels have been removed, selected primary turns in each of the then transversely extending legs are bent around an abutting stationary anvil to reposition the legs in the desired off-set relationship with the coil barrel.

3,670,378

PROCESS FOR THE PRODUCTION OF CAPACITORS

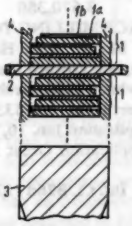
Reinhard Behn, Munich; Heinrich Gottlob, Regensburg; Hans Haid; Gerhard Hoyler, both of Munich, and Hartmut Kessler, Regensburg, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 18, 1969, Ser. No. 834,405

Claims priority, application Germany, June 24, 1968, P 17 64 541.9

Int. Cl. H01g *13/00*

U.S. Cl. 29—25.42 **18 Claims**



Capacitors are manufactured by winding a number of parent or master windings one upon another, coating the windings in common with metal on the face sides thereof by a metal spraying process and separating them one from the other. In one instance, the master windings are separated one from the other by the provision of inactive layers which project at the face sides or ends of the windings to prevent contacting of the layers of the windings during metal spraying. In another embodiment the interlayers are dimensioned as wide as the capacitively active layers and the face-side zones of the interlayers are masked during the application of the metallic layers. In yet another embodiment the inactive layers are completely metal coated and separation is provided by sawing or cutting in the zone of the interlayers. In this case, the interlayers remain on the finished partial capacitor as cover layers.

3,670,379

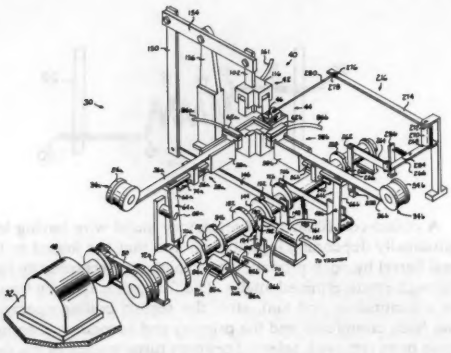
METHOD FOR FABRICATING MULTILAYER ELECTRICAL COMPONENTS

Martin L. Zelenz, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.

Division of Ser. No. 801,115, Feb. 20, 1969, Pat. No. 3,597,816. This application Jan. 11, 1971, Ser. No. 105,541

Int. Cl. H01g *13/00*

U.S. Cl. 29—25.42 2 Claims



Method and apparatus for forming thick film electrical capacitors. Strips of electrically conducting and electrically insulating material are fed in an overlapping manner to a cutting area. The strips are cut under sufficient pressure to form a bonded pair which is then transported to a remote position. Alignment between the bonded pair and a receptacle is achieved and the bonded pair is deposited therein. The cycle is repeated with the receptacle being rotated 180°. The rotation of the receptacle between cycles allows an interleaved capacitor of any desired size to be built up. When this is achieved, the receptacle may be removed to a die where sufficient pressure is applied to achieve adherence of all bonded pairs into a compact unit. This unit is then fired at selected temperatures to produce the capacitor.

3,670,380

FACE MILLING TOOL

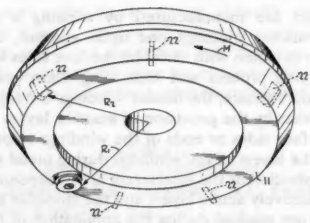
Arthur Ivan Walter Moore; John Howard Porter; Richard Frank Vearncombe, and Edward Karl Reiher, all of Staveley Lodge, Melton Mowbray, Leicestershire, England

Continuation-in-part of Ser. No. 533,107, Jan. 24, 1966, abandoned. This application Jan. 10, 1969, Ser. No. 17,354

Claims priority, application Great Britain, Jan. 24, 1965, 34,571/64

Int. Cl. B26d *1/00*

U.S. Cl. 29—105 8 Claims



A face milling tool comprises a holder and a bit of slice-like form of circular or lobed outline detachably secured on a seating by a screw or the like traversing a central aperture and presented so that the side wall is the rake face and the end face is the clearance face. The bit can be indexed on the securing means. A lobed bit has convex cutting edges of much larger radius than the average radius of the bit.

3,670,381

ROLLS AND ROLLERS PARTICULARLY FOR CONTINUOUS CASTING PLANTS, BAR DEFORMATION PLANTS AND FOR HOT ROLLING MILLS OPERATED AT LOW ROLLING SPEEDS

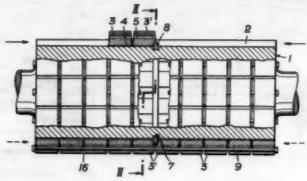
Rudolf Schoffmann, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-Und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed July 17, 1970, Ser. No. 55,830

Claims priority, application Austria, July 25, 1969, A 7189

Int. Cl. B21b *31/08*

U.S. Cl. 29—124 12 Claims



The invention proposes rolls and rollers, particularly for continuous casting plants, bar deformation plants and hot rolling mills operated at low rolling speeds, in which the improvement resides in that the working body of the rolls or rollers, respectively, is formed by a plurality of segments arranged side by side with play, which segments are provided with key-like projections engaging with correspondingly formed guiding grooves arranged at the roll or roller core. The core may be made of material of high strength, capable of absorbing great bending stresses, and the segments may be made of material resistant to heat and wear. Owing to the division of the working tools into two units and the provision of play between segments, heat cracks and ruptures are precluded.

3,670,382

METHOD FOR PRODUCING A REINFORCED RESINOUS IMPELLER AND PRODUCT

Donald J. Keehan, 31012 Huntington Woods Parkway, Bay Village, Ohio

Filed Jan. 5, 1970, Ser. No. 570

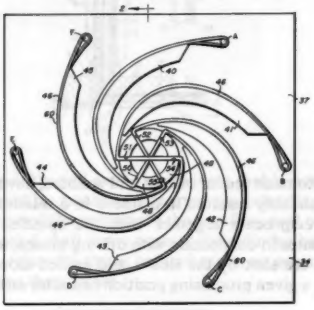
Int. Cl. B21k *3/04*; B23p *15/02, 15/04*

U.S. Cl. 29—156.8 CF 5 Claims

A method of making an impeller which is particularly adapted for use in a centrifugal pump and which has generally spirally extending vanes which extend outwardly from a central portion which method comprises the steps of selecting an elongated reinforcing member and winding the reinforcing member along the path of a vane and extending it to the central portion and then along the path of another vane and back to the central portion and so on, until there is built up a reinforcing structure having vane reinforcing walls which extend in basically the same direction as the vanes. The next step in the process is to apply tension to the wound reinforcing member and in the embodiment illustrated herein, this tension is applied by rotating a hub to which each of the reinforcing walls is attached which causes the same to be tensioned. The elongated reinforcing member preferably has resin applied thereto prior to winding the same; however, the resin may be applied after it is wound. In either event, the wound resin-wetted reinforcing member is then cured while the tension is maintained on the individual reinforcing walls. The cured reinforcing structure is next placed into a mold having the

shape of the finished impeller and the reinforcing walls of the reinforcing structure occupy positions in the mold which correspond to the vanes of the impeller. The next step is to introduce a curable resin into the mold which resin assumes the shape of and forms the finished impeller. The resin is next cured and the formed impeller is removed from the mold.

Also included as part of the disclosure herein is the winding mold for producing the reinforcing structure for the impeller. The winding mold comprises a plate which has a plurality of circumferentially spaced and generally radially extending form members secured thereto. These form members generally assume the contour of the finished impeller. A hub member is located generally centrally of the form members in a central opening in the plate and pins are positioned in the plate outwardly of the ends of the form members. The hub member in this embodiment is provided with a plurality of



diametrically extending slots which are adapted to receive the elongated reinforcing member which is wound on the winding mold.

The finished product is an impeller which includes in combination a composite resinous mass molded into the impeller shape which shape has and includes a plurality of circumferentially spaced and generally radially extending vanes extending from a central hub portion. A composite reinforcing structure is imbedded in the resinous mass and includes a hub member imbedded at the central hub portion and vane reinforcing walls secured to the hub member and imbedded in the respective vanes. Each of the vane reinforcing walls comprises an elongated reinforcing member secured to the hub member and arranged in the shape of the vanes. Each of the vane reinforcing walls is wetted with resin at some stage of its construction which resin is cured while each of the vane reinforcing walls is maintained under tension.

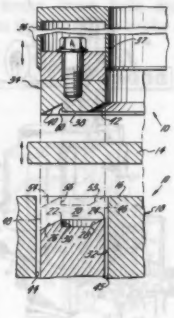
3,670,383

METHOD OF MANUFACTURE OF AN OIL SEAL RING HAVING DUAL SCRAPER ELEMENTS FOR ROTARY PISTON MECHANISMS

Michael T. Gavrun, Bayonne, N.J., assignor to Curtiss-Wright Corporation

Filed April 26, 1971, Ser. No. 137,284
Int. Cl. B23p *15/06*
U.S. Cl. 29—156.61 **4 Claims**

The method of fabricating an oil seal ring, having dual, concentrically spaced, scraper edges, for use in a rotary piston mechanism, comprises the step of placing a metal blank in a combination coining and punching device and thereafter actuating the latter to engage and deform the sheet material and substantially simultaneously punch out concentric, spaced portions of the sheet to form the inner and outer peripheral surfaces of the ring and an inner annular scraper edge and an



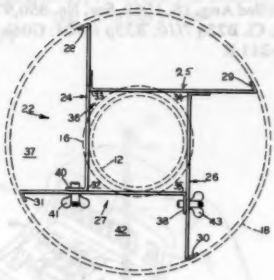
outer annular scraper edge defined by a partial shearing of the metal blank.

3,670,384

BRACKET FOR CENTERING CAPPED PIPE IN MANHOLES

August Milo, 1015 Schliefer Road, Hillside, N.J.

Filed Jan. 26, 1971, Ser. No. 109,772
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 J **2 Claims**



A centering bracket mountable in a manhole body for centering a pipe end smaller than the body and having a cap wider than the pipe, comprises four arms connected laterally to form a square having a size just adequate to accommodate the pipe end. Each of the arms has an extension of even length terminating in a bent portion designed to fit in frictional contact against the manhole body. One of the arms is removable so as to enable insertion of the pipe end cap in the larger space between the opened square and the body. Connecting means, such as thumb screws, are provided to connect the removable arm to form the square after the pipe cap has been passed through and the pipe end has been centered in the square.

3,670,385

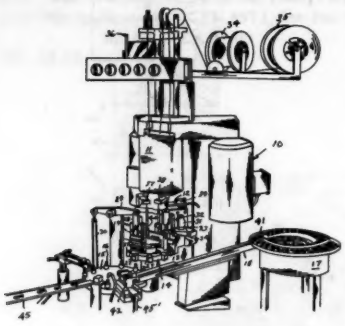
ASSEMBLY MACHINE

David I. Cropp, 501 Chestnut St., Meadville, Pa.

Filed June 8, 1970, Ser. No. 44,266
Int. Cl. H05k *13/04*; **B23p** *19/04*
U.S. Cl. 29—203 R **18 Claims**

The specification describes a machine for inserting several pieces of wire of a predetermined length through a small disk which may be of plastic material at a high rate of production.

The wire is taken from rolls, straightened, measured to length, cut off, and forced through the holes in the disk and the disks



with wire inserted in them are moved along a trough conveyor where they can be visually inspected.

3,670,386

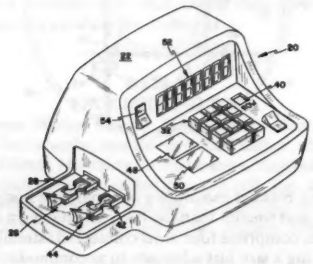
ENCODING AND VERIFYING INFORMATION

Louis E. Davis, Bountiful; Billy M. Jensen, Sandy; Floyd L. Larson, Granger; Rainer F. Huck, and Stephen L. Stumph, both of Salt Lake City, all of Utah, assignors to Bio-Logics, Inc.

Filed Aug. 18, 1969, Ser. No. 850,978

Int. Cl. B23q 7/10; B23p 19/04; G06k 1/00

U.S. Cl. 29—211 R **13 Claims**



Method and apparatus for encoding a device presenting rows of encodable sites and for verifying the correctness of the encoding of such a device, the apparatus including a ram assembly for press-fitting balls or the like, received from a ball-feeder assembly, into selected ones of the encodable sites, which sites take the form of blind cavities. The encodable device is light-transmitting and, after being encoded, the rows of sites are successively sensed by an optical reader to verify the accuracy of the encoding procedure. Electrical signals, derived from optical signals generated by the reader and representing the code of each row, are converted to Binary Coded Decimal (BCD) data format and stored in a circulating shift register in a row-by-row fashion so that the stored information can be subsequently converted into human readable form.

3,670,387

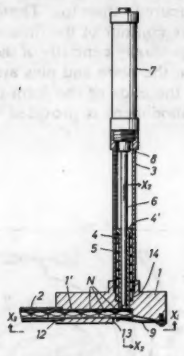
NUT AND WASHER FEEDING DEVICE

Tetsuya Nagao, 23, 2-chome, Kitadori, Minamiterakata, Moriguchi, Japan

Filed Dec. 16, 1970, Ser. No. 98,609

Int. Cl. B23q 7/10

U.S. Cl. 29—211 R **1 Claim**



An automatic feeder of nuts and washers, having a long slim spindle slidably inserted in a sleeve in a relation to have the sleeve reciprocate together with the spindle as the latter reciprocates in connection with driving means, so that nuts or washers are shot by the sleeve and guided along the spindle down to a given processing position one after another continuously.

3,670,388

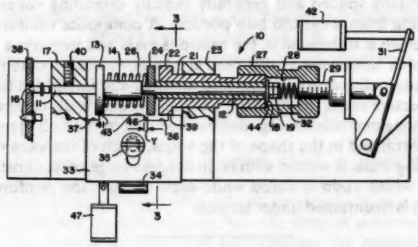
SELF-TESTING INSERTION TOOL AND METHODS OF INSERTING WORKPIECES

Ronald H. Jack, Rolling Meadows, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 29, 1969, Ser. No. 888,730

Int. Cl. B23p 19/04

U.S. Cl. 29—244 **11 Claims**



A workpiece insertion tool includes a shaft for engaging the workpiece, a housing slidably mounted on the shaft, a spacer integrally attached to the shaft, an elastic member between the housing and the spacer, and a blocking member. To insert a workpiece into a workpiece-receiving member a force is applied to the housing. The elastic member initially operates to transmit the force to the spacer and therefore to the shaft so as to apply a gradually increasing force tending to insert the workpiece. Failure of the elastic member to compress to a predetermined extent, before a predetermined movement of the workpiece into the receiving member occurs, operates to bring the blocking member into engagement with the housing to immobilize the tool and to prevent complete insertion of

the workpiece. Whenever the elastic member does compress sufficiently, further force is applied to the housing and shaft to complete the insertion.

3,670,389

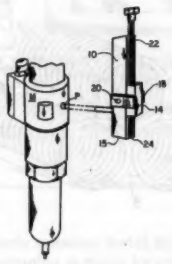
TOOL FOR REMOVING FUEL INJECTORS

Joseph F. Shepanski, 216 Huffman Mill Road, Burlington, N.C.

Continuation-in-part of Ser. No. 822,960, May 8, 1969, abandoned. This application Dec. 15, 1970, Ser. No. 98,467

Int. Cl. B23p *19/04*

U.S. Cl. 29—256 **8 Claims**



A tool for quickly and easily removing a fuel injector from the cylinder head by means of a bearing pin extending from a vertically elongated thrust bar into the overflow port of the injector. A threaded shaft bears against the cylinder head and, upon rotation, raises the thrust bar and exerts an upward force on the pin to free the injector.

3,670,390

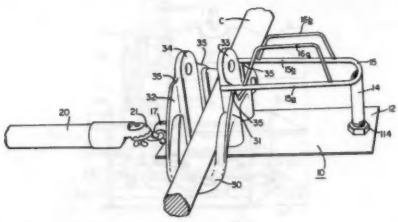
TOOL FOR APPLYING SUSPENSION CLAMPS TO POWER LINES

Leonard M. Brzoska, 627 Old Elm St., Conshohocken, Pa.

Filed Sept. 4, 1970, Ser. No. 69,869

Int. Cl. B25b *27/14*

U.S. Cl. 29—271 **6 Claims**



A special tool at the end of an elongated insulated pole manipulates the suspension clamp and facilities installation thereof on high voltage electric power line conductors without de-energizing the lines. A cotter key tool facilitates inserting the cotter key in the clevis pin.

3,670,391

PILOT PIN FOR MOUNTING AUTOMOBILE WHEELS

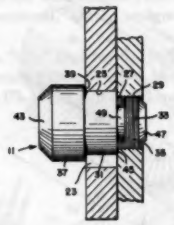
Robert J. Cahill, 913 Rittenhouse Street, Philadelphia, Pa.

Filed May 6, 1970, Ser. No. 35,119

Int. Cl. B25b *27/14*; B23p *19/00*

U.S. Cl. 29—273 **6 Claims**

A pilot pin for assisting in mounting an automobile wheel on a wheel drum, which pilot pin properly aligns selected wheel disk holes with corresponding brake drum holes and holds them in alignment while bolts are inserted and screwed into the remaining aligned holes. The pin includes a body, a threaded stud at one end of the pin adapted to turn into the threads of the brake drum hole, the body being of larger diameter than the brake drum hole and having a body shoulder that contacts the rim of the brake drum hole to form



a stop for limiting the penetration of the threaded stud into the drum hole, a head at the other end of the pin which is of larger diameter than the body and of smaller diameter than the wheel disk hole, and a head shoulder on the head for catching and holding a rim of a wheel disk hole to support the wheel disk on the brake drum while the bolts are being inserted into the aligned holes and screwed therein.

3,670,392

METHOD OF MAKING FLEXIBLE BRAKE BANDS

Charles H. Haas, Philadelphia, Pa., assignor to The Budd Company, Philadelphia, Pa.

Filed Dec. 29, 1970, Ser. No. 102,476

Int. Cl. B23p *17/00*

U.S. Cl. 29—411 **14 Claims**

This application discloses a method of making flexible brake bands from a continuous sheet of band material, such as thin stainless steel or high carbon steel and sheet lining by providing band end lugs near the side edges, integrally on the sheet by rolls or dies, or by welding on lug strips, applying lining from a continuous sheet, and cutting bands in unit lengths from the composite sheet.

3,670,393

METHOD OF FORMING HONEYCOMB PANEL

Elmer C. Almond, Lansdale, Pa., assignor to The Budd Company, Philadelphia, Pa.

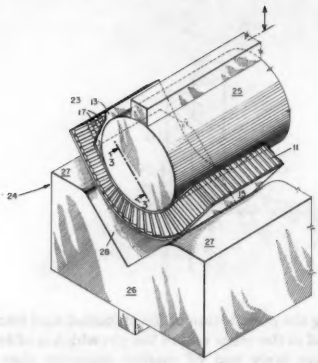
Filed April 9, 1970, Ser. No. 26,921

Int. Cl. B23p *17/00*

U.S. Cl. 29—423 **3 Claims**

A method of forming honeycomb panels of high strength material whereby the panel to be formed is positioned between an inner metallic cover sheet and an outer sheet of resilient material. The sandwich pack so formed is disposed between die set members which are moved relative to each other to deform the pack. During the forming operation, the

edge portions of individual honeycomb cores bite into the bonding surface of the resilient cover sheet material which functions as a structural restraint to minimize dimensional



failure by preventing the spreading apart of adjacent cores one from another on the tension side of the bend. All of the bending of the panel is taken in uniform deformation on the compression side of the panel.

3,670,394

METHOD OF CONNECTING METAL CONTACT AREAS OF ELECTRIC COMPONENTS TO METAL CONDUCTORS OF FLEXIBLE SUBSTRATE

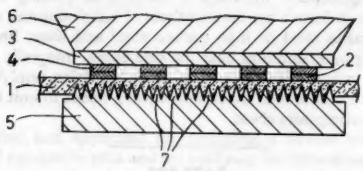
Hendricus Petrus Cornelis Daniels; Theodorus Johannes Van Der Ven, and Hans Gerard Karel Tates, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1970, Ser. No. 86,472

Claims priority, application Netherlands, Nov. 13, 1969, 6917128

Int. Cl. B23k *21/00*

U.S. Cl. 29—470.1 **5 Claims**



The metal contact areas of electric components, for example, semiconductor bodies, are connected to metal conductors of a flexible substrate by orienting the contact areas relative to the conductors, pressing the contact areas and the conductors against each other, temporarily reinforcing the flexible substrate by causing projections of a pressure member to penetrate into the foil as a result of ultrasonic vibrations, and subsequently ultrasonically welding the contact areas to the conductors of the flexible substrate.

3,670,395

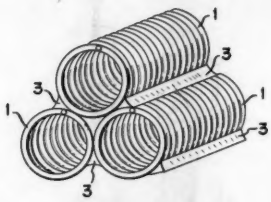
METHOD OF MAKING A HONEYCOMB BLOCK COLLIMATOR

Isamu Abe, Kawasaki; Hideo Yashiro, Tokyo; Naoyuki Sori, Tokyo; Sotaro Hatano, Tokyo; Tomiyasu Katsumoto, Tokyo, and Tadao Suzuki, Ichikawa, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Continuation-in-part of Ser. No. 726,041, Sept. 18, 1970, abandoned. This application Sept. 18, 1970, Ser. No. 73,573

Int. Cl. G21f *5/02*; H01j *35/16*

U.S. Cl. 29—471.1 **10 Claims**



A honeycomb block is made by winding a tungsten metal wire compactly around a core and then removing the core, thereby fabricating a compactly wound coil member. The coil members are arranged side by side and are bonded together with a metal paste bonding agent to form the honeycomb block.

3,670,396

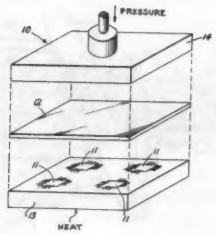
METHOD OF MAKING A CIRCUIT ASSEMBLY

Frank A. Lindberg, Linthicum, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 12, 1971, Ser. No. 132,940

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.3 **6 Claims**

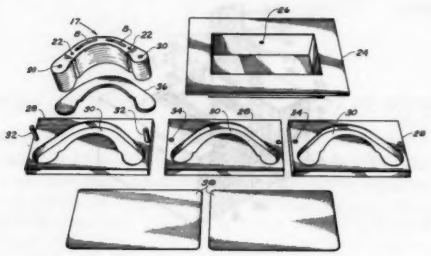


To bond the beam leads of a plurality of integrated circuit chips to a metallization layer on a transparent compliant film, the chips are first registered in matching etched holes on a flat ground steel block. The flat beam leads lie on the surface of the block and support the chips. The film is arranged on top of the etched block with its metallization pattern in alignment with the corresponding beam leads. At room temperature the film is pressed downwardly on top of the exposed beam leads by an opposing flat ground block. Heat is then applied for bonding, and pressure is maintained until the assembly cools to prevent misregistration.

3,670,397
METHOD OF FABRICATING A LAMINATED METAL MEMBER

Joseph C. Lewis, Pasadena, Calif., assignor to North American Rockwell Corporation

Continuation-in-part of Ser. No. 604,270, Dec. 23, 1966, abandoned. This application Feb. 24, 1970, Ser. No. 13,743
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.3 4 Claims

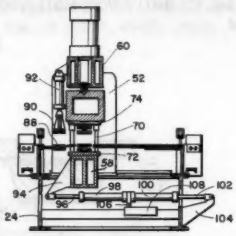


A laminated, relatively massive metal member requiring a minimum of finish machining is made by cutting a number of thin metal laminae in the shape of the final member. The laminae are stacked into the shape of the member, and held therein by suitable restraining means. The laminae stack is then diffusion bonded together at an elevated temperature and pressure in a non-oxidizing environment.

3,670,398
METHOD AND APPARATUS FOR JOINING STRIP ENDS EMPLOYING A STITCHER ASSEMBLY

Carl H. Minton, c/o ADS Machinery Corp. P.O. Box 1027, Warren, Ohio

Filed Feb. 13, 1970, Ser. No. 11,205
Int. Cl. B21d *39/00*
U.S. Cl. 29—505 10 Claims

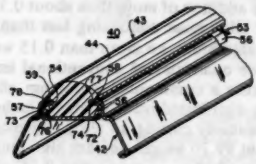


A method of joining lengths of strip in which the trailing and leading ends, respectively, of successive coils of strip are clamped in overlapping relationship, subjected to a punching operation to provide a series of deformed portions along a line perpendicular to the center line of the strip, subjected to a flattening operation along said series of deformations to effect the tight interengagement of the strip ends along the deformations, and subsequently subjected to a second punching and flattening operation to form a second series of interengaging deformations a spaced distance from the first deformations, all while the strips are clamped in fixed position. The strip stitcher assembly has a fixed base on which are mounted the entry and exit clamps. A punch and die assembly and a flattener assembly are mounted on a subframe slidable on the fixed frame of the stitcher along the center line of the strip. A pair of hydraulic cylinders mounted in back-to-back relationship are employed to index the subframe of the stitcher, actuation of the first cylinder moving the subframe a distance equal to the separation between the center line of the punch and die assembly and the center line of the flattener assembly and subsequent actuation of the second cylinder moving the subassembly a further equal distance in the same direction.

3,670,399
METHOD OF FORMING TRIM MEMBER

Billy George, Cincinnati, Ohio, assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 726,729, May 6, 1968, Pat. No. 3,565,478. This application Oct. 7, 1970, Ser. No. 78,788
Int. Cl. B21d *39/00*; B23p *11/00*
U.S. Cl. 29—509 3 Claims

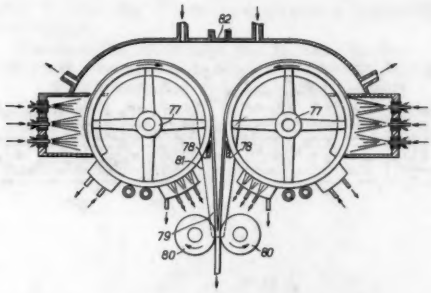


An elongated metal strip provided with spaced lengthwise doubled flanges therein and wing members extending outwardly of the doubled flanges, is assembled with a rubber-like resilient facing by swinging the wing members outwardly to cause the doubled flanges to swing inwardly into engagement with opposite faces of the facing to attach the facing to the body with a portion of the facing exposed.

3,670,400
PROCESS AND APPARATUS FOR FABRICATING A HOT WORKED METAL LAYER FROM ATOMIZED METAL PARTICLES

Alfred Richard Eric Singer, Swansea, Wales, assignor to National Research Development Corporation, London, England

Filed May 9, 1969, Ser. No. 823,283
Int. Cl. B23k *19/00*; B23p *17/00*
U.S. Cl. 29—527.5 31 Claims



A process for the fabrication of metal in shapes of long length and relatively thin cross section by deposition of molten metal on to a substrate and subsequent removal of the shaped metal article therefrom, in which a stream of gas-atomized particles of molten metal is directed on to a substrate, and caused to coalesce and form a coherent layer which is subjected while still hot to hot working, hot working being carried out either (a) before or after removal from a non-deformable substrate or (b) after removal from a deformable substrate.

3,670,401

METHOD OF FABRICATING ALUMINUM ALLOY ROD

Roger J. Schoerner, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 814,183, April 7, 1969, Pat. No. 3,512,221, which is a continuation-in-part of Ser. No. 779,376, Nov. 27, 1968, abandoned, which is a continuation-in-part of Ser. No. 730,933, May 21, 1968, abandoned. This application April 1, 1970, Ser. No. 31,461

Int. Cl. B22d ; B23p 17/00

U.S. Cl. 164—76 13 Claims

An aluminum alloy wire having an electrical conductivity of at least 61 percent based on the International Annealed Copper Standard and unexpected properties of increased ultimate elongation, bendability and fatigue resistance when compared to conventional aluminum alloy wire of the same tensile strength. The aluminum alloy wire contains substantially evenly distributed iron aluminate inclusions in a concentration produced by the addition of more than about 0.30 weight percent iron to an alloy mass containing less than about 99.70 weight percent aluminum, no more than 0.15 weight percent silicon, and trace quantities of conventional impurities normally found within a commercial aluminum alloy. The substantially evenly distributed iron aluminate inclusions are obtained by continuously casting an alloy consisting essentially of less than about 99.70 weight percent aluminum, more than 0.30 weight percent iron, no more than 0.15 weight percent silicon and trace quantities of typical impurities to form a continuous aluminum alloy bar, hot-working the bar substantially immediately after casting in substantially that condition in which the bar is cast to form continuous rod which is subsequently drawn into wire without intermediate anneals and annealed after the final draw. After annealing, the wire has the aforementioned novel and unexpected properties of increased ultimate elongation, electrical conductivity of at least 61 percent of the International Annealed Copper Standard, and increased bendability and fatigue resistance.

3,670,402

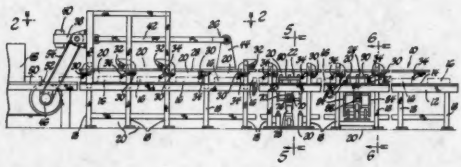
MULTI-STATION MACHINE FOR AUTOMATIC PERFORMANCE OF SEQUENTIAL OPERATIONS

Chauncey L. Dirks, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 26, 1970, Ser. No. 50,167

Int. Cl. B23q 7/04; B65g 25/08

U.S. Cl. 29—563 2 Claims



In preferred form, a cylinder head casting defining machine having a plurality of work stations through which the cylinder head castings are moved on guide rails by a crank operated harmonic transfer mechanism which combines fast transfer from station to station with slow initial and terminal portions of the movement so that excessive shocks and part overrun are avoided. A pneumatic tool actuating mechanism is mechanically interconnected with the transfer means to positively time operation of the definning tools to occur during the return stroke of the transfer mechanism.

3,670,403

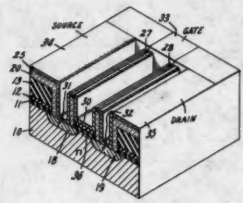
THREE MASKING STEP PROCESS FOR FABRICATING INSULATED GATE FIELD EFFECT TRANSISTORS

Howard Lawrence, Lafayette, and Peter C. Schaefer, Syracuse, both of N.Y., assignors to General Electric Company

Filed March 19, 1970, Ser. No. 21,161

Int. Cl. B01j 17/00; H01g 13/00

U.S. Cl. 29—571 4 Claims



A three resist-masking step process produces lower cost monolithic integrated circuit insulated gate field effect transistors with improved electrical characteristics. To fabricate a metal-nitride-oxide-silicon device, layers of grown oxide, silicon nitride, and field oxide are deposited on a wafer, and the first mask facilitates etching of source and drain openings. After depositing activator impurity and glass, and diffusing, the second mask is used in simultaneously etching contact holes and a gate opening using the silicon nitride as an etch stop. The third mask delineates the contact metallizations.

3,670,404

METHOD OF FABRICATING A SEMICONDUCTOR

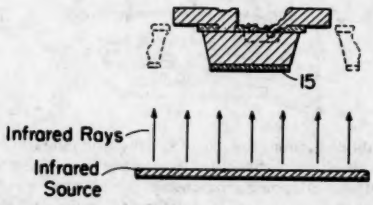
Mototaka Kamoshida, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 6, 1969, Ser. No. 831,041

Claims priority, application Japan, June 10, 1968, 43/40071

Int. Cl. B01j 17/00; H01l 7/00

U.S. Cl. 29—574 6 Claims



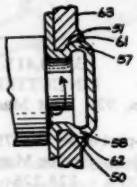
Individual small semiconductor elements are fabricated and the front and back surfaces of the elements aligned by utilizing the difference in penetration of infrared rays as viewed from the other side of the elements by an infrared optic system. The difference is afforded by providing the reverse side of the semiconductor element with an irregularity in the thickness of either an insulating film, a photoresist film, the density of a doped impurity, or irregularities in the underside surface of the semiconductor element itself.

3,670,405

METHOD OF MAKING A DYNAMOELECTRIC MACHINE HAVING IMPROVED HOUSING, BEARING AND SUPPORT STRUCTURE

Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company

Filed Jan. 29, 1970, Ser. No. 6,664
Int. Cl. H02k 15/00
U.S. Cl. 29—596 1 Claim



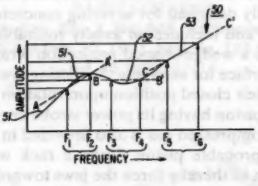
A stator assembly is pressed into a housing member having an end frame and bearing receiving chamber. Bearing means sized to close tolerances have angularly spaced apart surface areas secured to an interior wall of the bearing receiving chamber and define lubricant transmitting channels therewith. The bearing means are slidably received in the chamber and secured therein by an interference fit or structural adhesive material. An oil cover is mechanically secured to an end frame by fasteners expanded in openings in the frame. The openings may be used, prior to securement of the oil cover, to permit removal of rotor centering shims from the machine air gap. In a preferred arrangement, the fasteners are secured to the frame without the application of substantial resultant forces to the end frame and bearing means.

3,670,406

METHOD OF ADJUSTING INDUCTIVE DEVICES

Roger L. Weber, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 671,697, Sept. 29, 1967, Pat. No. 3,548,492. This application Feb. 4, 1970, Ser. No. 12,510
Int. Cl. G01r ; G05f ; H01h
U.S. Cl. 29—593 5 Claims



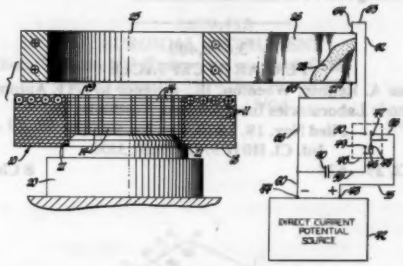
Disclosed is a method of using a flow of abrasive-filled air to adjust an inductive device having a solid core by removing a portion of the core. The dimensions of the resulting air gap thus determine the final value of the device. The inductive device is adjusted after being connected in a circuit to provide the desired frequency response characteristic of the circuit by comparing the actual voltage amplitudes of selected frequency pairs with the desired voltage amplitudes of the same frequency pairs.

3,670,407

METHOD OF REDUCING IRON LOSSES IN THE STATOR CORES OF ALTERNATING CURRENT MACHINES

Albert B. Mewhinney, and Ellwood P. Herzog, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed March 9, 1970, Ser. No. 17,378
Int. Cl. H02k 15/02, 15/12
U.S. Cl. 29—596 1 Claim



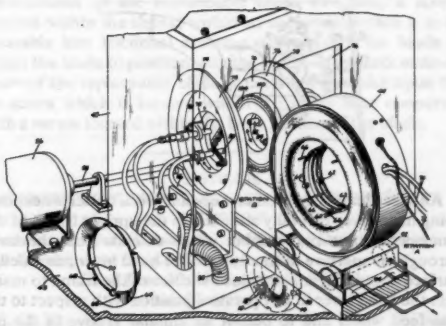
A method for reducing eddy current losses in the laminated stator cores of alternating current machines. The core is supported only on the tooth tips by the ledge portion of a support member of circular cross-section which engages only the tips of the teeth around the circumference of the bore at its termination at one end surface of the core. A single turn electrical coil is placed adjacent the opposite end surface of the core with the axis of the coil in the same direction as the axis of the core and a surge of electrical current is passed through the coil by discharging a capacitor or a bank of capacitors therethrough. The magnetic fields produced by the flow of current through the coil and the resulting induced currents flowing on the face of at least the end lamination of the stator core adjacent the coil interact to produce a circumferentially uniform, axial magnetic force which flexes the unsupported portion of the stator core in a direction away from the coil, thereby deflecting the laminations to produce a circumferentially uniform, radial slip-shear movement between adjacent laminations to interrupt any electrical circuits which may be present between adjacent laminations.

3,670,408

METHOD OF MAINTAINING A LAMINATED ARTICLE UNDER COMPRESSION DURING A PART OF ITS MANUFACTURE

Marion W. Sims, Fort Wayne, Ind., assignor to General Electric Company

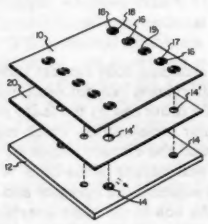
Division of Ser. No. 802,934, Feb. 27, 1969, Pat. No. 3,616,056. This application July 2, 1970, Ser. No. 51,759
Int. Cl. B29f 5/00; H01f 7/06; B25b 11/00
U.S. Cl. 29—602 9 Claims



Method for magnetically clamping together selected regions of a laminated article during at least part of its manufacture,

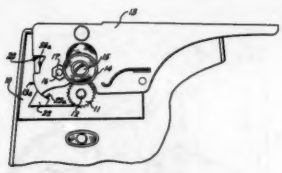
especially effective in the manufacture of magnetic cores for use in inductive devices. A predetermined magnetic field is applied to the article or established in such a way that selected regions, such as extremities which tend to flare apart, are magnetically clamped. Under certain circumstances, the magnetic field may also be used to inductively heat the selected regions of the laminated article, for example, when heat-hardenable bonding material in unhardened form is disposed between adjacent laminations in the vicinity of the regions for hardening the bonding material.

3,670,409
PLANAR RECEPTACLE
William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Nov. 19, 1970, Ser. No. 90,951
Int. Cl. H01r *9/12*; H05k *3/00*
U.S. Cl. 29—625 **8 Claims**



A planar receptacle for pluggable mounting of electronic component leads therein which is formed by applying a resilient, electrically conductive material over an apertured base, and forming a pattern of planar cuts in said resilient layer over each aperture in the base such that when an electronic component lead is pressed onto the resilient layer over an aperture, the resilient layer will deform into the aperture to form at least one contact apron capable of supporting said electronic component lead and capable of making electrical contact with said lead.

3,670,410
CAN OPENER WITH A HAND LEVER REMOVABLE FROM THE FRAME BY THE POSITION OF SAME
Robert E. McLean, Raytown, Mo., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed July 6, 1970, Ser. No. 52,549
Int. Cl. B76b *7/38*
U.S. Cl. 30—4 R **4 Claims**

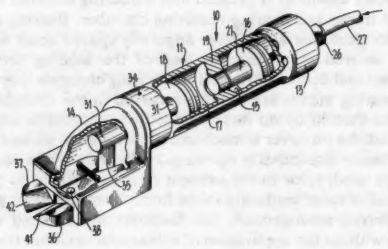


An electrically powered can opener has a cutter wheel carrying hand lever pivotally attached to the upright frame of the can opener by a pin member which extends from the lever through an aperture in the frame. The hand lever has an edge surface contacting an embossed surface of the frame to maintain the hand lever in an operative position with respect to the can feed wheel and to permit an annular groove in the pin member to engage a portion of the frame adjacent the aperture therein.

A suitably sized notch is located in the hand lever adjacent the frame boss contacting edge of same thereby permitting the lever notch to be aligned with the boss, the hand lever moved downwardly so that it is no longer in secured engagement with the can opener frame. This movement enables the hand lever and associated pin member to be withdrawn from the aperture within the frame.

A second embodiment utilizes cooperating bosses respectively extending from the can opener frame and from the inner surface of the hand lever to both allow operative hand lever movement and yet to permit separation and removal when the hand lever is moved to cause disengagement of the respective bosses.

3,670,411
PIN CUTTER
Rudolph W. Peters, 927 West MacArthur Blvd., Oakland, Calif.
Continuation-in-part of Ser. No. 799,383, Feb. 14, 1969, abandoned. This application March 17, 1971, Ser. No. 125,226
Int. Cl. B26b *17/00*
U.S. Cl. 30—180 **12 Claims**

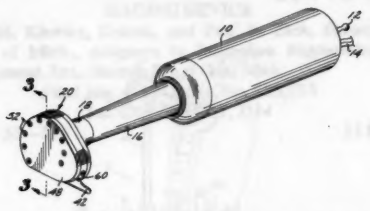


Two embodiments of a power-actuated cutter for severing metal pins or bars are described. The first embodiment is designed for severing, for example, orthopedic pins substantially flush with the surfaces of the bone in which they are embedded without significantly moving or otherwise disturbing such pins and the surrounding bone structure. The cutter includes a pair of blade-equipped cutter jaws selectively movable between open and closed positions, and a ram operative to force such jaws toward their closed position. A reciprocable piston having its power stroke energized by the application of compressed gas thereto is coupled to the ram by force multiplier structure operative to transmit to the ram an increased multiple of the force association with movement of the piston through the power stroke thereof. The second cutter embodiment is especially designed for severing concrete reinforcing bars or the like and includes an axially rotatable, cylindrical drum which has a wedge-shaped projection wrapped around its cylindrical surface for engaging the cutting jaws and forcing them towards their closed position upon rotation of the drum. A reciprocable piston having its power stroke energized by the application of compressed gas is also provided in this embodiment. The reciprocable piston drives a rack which in turn rotates the drum to thereby force the jaws toward their closed position.

3,670,412
POWER CUTTER
Frank W. Cunningham, 23151 Doris Way, Torrance, Calif.
Filed Sept. 28, 1970, Ser. No. 76,044
Int. Cl. B26b *25/00*
U.S. Cl. 30—276 **6 Claims**

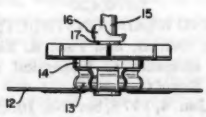
A power cutter for cutting deformable material and including a frame which has upper and lower jaws for receiving the material to be cut. The lower jaw includes a recess within

which a cutting disc is rotatable by an associated power drive. The upper jaw is formed with depending cheek portions located on opposite sides of the cutter means to define side passages. The cheek portions extend forwardly of the cutter disc in overlying relation to a projecting guide shoe portion of the lower jaw to thereby define a frontal passage ahead of the cutting disc. The access openings to the frontal passage and



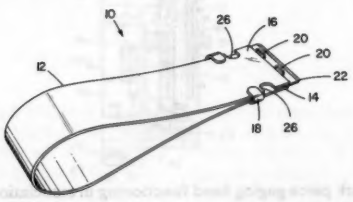
the side passages are made sufficiently large that the material to be cut can pass therethrough, but sufficiently small that a person cannot inadvertently insert his finger and become cut by the cutting disc. The recess within which the cutter is rotatable and which is defined by the frame upper and lower jaws is of inverted U-shape to make accidental insertion of a finger even more difficult, the material to be cut deforming into a corresponding U-shape for entry and cutting thereof.

3,670,413
COUPLING FOR TOOL ELEMENT
Edwin J. Weber, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Aug. 21, 1970, Ser. No. 65,953
Int. Cl. B26b *25/00*
U.S. Cl. 30—276 **3 Claims**



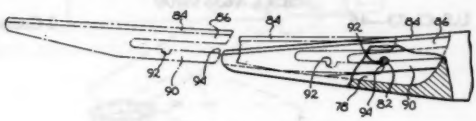
An electric grass trimming device comprising a handle including a grip and trigger switch at one end and an electric motor at the other end, the motor being arranged to drive a cutting blade mounted beneath the motor. An improved coupling arrangement between the blade and the motor shaft is described.

3,670,414
PAINT SCRAPER
Merrick C. Stecker, Rte. 1, Box 645, Baltimore, Md.
Filed Feb. 17, 1971, Ser. No. 115,975
Int. Cl. B26b *21/16*
U.S. Cl. 30—338 **2 Claims**



A paint scraper is provided which consists of resilient sheet metal strip which is bent back on itself so that its two opposite ends are positioned adjacent to and in a juxtaposition to one another. One of the ends of the strip is formed with at least two spaced tabs which are bent substantially angularly thereto and extending past the other end of the strip. A scraping blade is provided which has spaced slots corresponding to the spaced tabs on the end of the strip and it is positioned with the spaced tabs engaging in the slots. The blade is held in position between the ends of the strip. A latch bar is provided for locking the ends of the strip in position adjacent to each other to maintain the blade in an operative position.

3,679,415
SURGICAL INSTRUMENT
Anthony T. Rose, 603 Hudspeth Ave., Simi, Calif.
Filed June 12, 1970, Ser. No. 45,803
Int. Cl. B26b *13/04*
U.S. Cl. 30—349 **3 Claims**

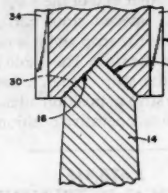


A construction of surgical scissors with replaceable blades wherein the pivotal connection between the scissor shanks includes a first fastener threadingly binding together the shanks, a second fastener cooperating with the first fastener causing an expansion of the first fastener into tighter cooperation with the shanks. A nonmetallic, hard surface, low friction, bearing surface element is located between the shanks adjacent the pivotal connection. A first embodiment of replaceable blade structure wherein a longitudinal dovetail projection is formed upon the blade which is to cooperate with a dovetail recess located within the cutting edge portion of the shank. A slit is provided within the shank to effect resilient movement of the shank about the dovetail. A set screw is provided within the shank to clamp together the shank about the dovetail when the blade is positioned as desired. In a second embodiment of the replaceable blade structure, the blade has a longitudinal access slot within the body portion of the blade. A recess is located upon the lower edge of the slot approximately at the mid-point of the slot length. The recess is to cooperate with a pin fixedly located within the shank of the scissors. In a third embodiment of the replaceable blade structure, a screw, located within the shank, within an eccentric section is to be rotatable into frictional abutting contact with the blade to retain the blade in position with the shank. In a fourth embodiment of the replaceable blade structure, a shoulder upon the set screw which is located within the shank is to cooperate with a recess located within the body portion of the blade.

3,670,416
CONNECTING METAL ELEMENTS AND PRODUCTS THEREOF
Ernest A. Kroder, Hellam, Pa., assignor to Dentsply Research & Development Corp., Wilmington, Del.
Filed June 29, 1970, Ser. No. 50,444
Int. Cl. A61c *3/02*
U.S. Cl. 32—48 **5 Claims**

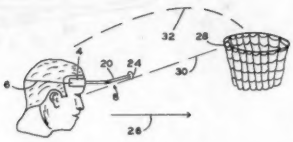
A method of connecting metal elements by a resistance welding process to produce a high strength joint and particu-

larly to connect a refractory type pre-formed carbide head to



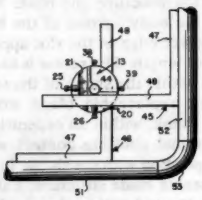
a shank of a dental bur formed from steel, and the product formed by such method.

3,670,417
SHOT SPOTTER
Kathryn C. Rogers, 1410 S. 15th St. Hbg. Park Apts. 0202, Harrisburg, Pa.
Filed Jan. 28, 1971, Ser. No. 110,680
Int. Cl. A63b *69/00*
U.S. Cl. 33—46 2 Claims



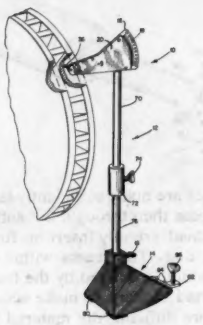
A head mounted device is used to train the shooter in basketball shooting. The device is mounted on the forehead of the user and has a flexible pointer which is adjusted relative to the basket rim to indicate the line-of-shot. With the line-of-shot now indicated, the shooter now gives the basketball the required impetus and accuracy to reach the basket.

3,670,418
ANGULARLY ADJUSTABLE SQUARE HOLDER
David G. Hamilton, Jr., 911 N. Beach St., Daytona Beach, Fla.
Filed Aug. 4, 1970, Ser. No. 60,827
Int. Cl. B43l *7/06*
U.S. Cl. 33—75 R 6 Claims



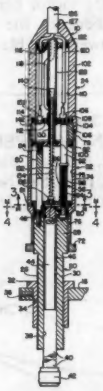
A holder composed of rotatively adjustable sections or halves each adapted to detachably support a square, such as a framing square, and combining with the two squares to provide a protractor-like instrument capable of supporting the blades of the squares at different desired angles relative to one another for use in accurately lining up pipes preparatory to joining the pipes by welding. An outer side of each holder half is grooved to adjustably receive a blade of one of the squares which is clamped therein. The holder halves are capable of being clamped together in different rotatively adjusted positions for accurately positioning the other blades of the two squares at desired angles relative to one another.

3,670,419
RUN OUT INDICATOR FOR DISC BRAKE
Frederick R. McFarland, and Walter L. Diffenderfer, both of Lancaster, Pa., assignors to K-D Manufacturing Company, Lancaster, Pa.
Continuation of Ser. No. 840,706, July 10, 1969, abandoned.
This application May 5, 1971, Ser. No. 140,383
Int. Cl. G01b *3/22, 5/00*
U.S. Cl. 33—172 B 1 Claim



An indicator is adjustably mounted on a vertical support rising from a heavy base. Adjustment means are provided on the base for pivotally moving it in a vertical plane once it is positioned, to position the indicator with respect to the surface of a disc brake rotor. Through pivoted arms the indicator senses the run out of the rotor, as it is rotated, and indicates readings on a scale.

3,670,420
GAGING HEAD CONSTRUCTION
Frank M. Kiewicz, Detroit, and Paul R. Zink, Farmington, both of Mich., assignors to Inspection Engineering and Equipment, Inc., Royal Oak, Mich.
Filed Jan. 4, 1971, Ser. No. 103,592
Int. Cl. G01b *7/12, 7/14*
U.S. Cl. 33—174 L 14 Claims



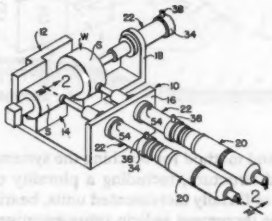
A work piece gaging head functioning in association with an electronic circuit, comprising an electrical switch-type gaging structure embodying features providing adjustable positioning to very substantial tolerances and having an indicator point and stem not only adapted to contact a work piece surface for gaging but also being substantially retractable from such sur-

face to allow for excesses of work piece material in the gaging area. The gaging head embodies circuitry components designed to signal the presence of an undersized or an oversized dimension, and to indicate the "go" dimension which lies within the predetermined high and low limits of the gaging system.

3,670,421
GAGING DEVICE

Frank M. Klewicz, Detroit, and Paul R. Zink, Farmington, both of Mich., assignors to Inspection Engineering and Equipment, Inc., Batavia Royal Oak, Mich.

Filed Jan. 4, 1971, Ser. No. 103,593
Int. Cl. G01b 7/12, 7/14
U.S. Cl. 33—174 L **11 Claims**

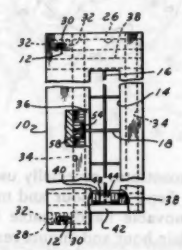


A gaging device for automatically signalling the presence of dimensions in a work piece removably placed in the device for gaging, wherein gaging heads are positioned at one or more sites of the device for contact with the work piece. Pneumatic or hydraulic means are associatedly conjoined to the gaging head for rapid and automatic advance of an indicator pin which touches the work piece at a pre-determined position to signal an undersize, within tolerance, or oversize dimension through an electronic circuit system to a visual signal. The pneumatic or hydraulic means for advancing the gage head indicator pin to the work piece also includes means for retracting the indicator pin. The latter is normally and initially positioned in retracted attitude when the work piece is placed in the gaging fixture. After the measurement has been made, the gage head indicator pin is automatically retracted to permit facile removal of the work piece from the fixture.

3,670,422
MULTIPLE SIGHT FOR ACHER'S BOW

Herve A. Stebbins, and John A. Stebbins, both of 400 Cooley St., Springfield, Mass.

Filed March 8, 1971, Ser. No. 121,741
Int. Cl. F41g 1/00; F41b 5/00
U.S. Cl. 33—265 **6 Claims**

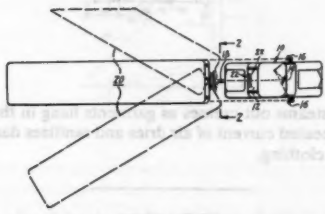


Multiple sight for an archer's bow having a vertically elongated window in which are disposed a vertical cross-hair wire and a plurality of horizontal cross-hair wires, the ends of said wires being carried by mounting means individually adjustable for a "fine" setting of each wire. Threaded passages along the sides of the window are provided in the body of the sight and each wire end mounting and holding means is threaded therein. The horizontal wire holding elements further include means engageable by the working tip end of a turning tool and said engageable means also permits passage of a reduced shank of the tool through the holding elements for access to and adjustment of other elements in the same passage.

3,670,423
VEHICLE BACKING GUIDANCE DEVICE

Don Leber, 733 Oak St., Colusa, Calif.

Filed Jan. 6, 1970, Ser. No. 920
Int. Cl. G01c 1/00
U.S. Cl. 33—286 **1 Claim**



A horizontal scale is attached to the rear window of a motor vehicle to align either with a particular element on a towed vehicle or with a scale attached to such vehicle so that the driver can accurately back the towing vehicle for hooking-up with the towed vehicle and for backing the latter in a straight line or at an angle as indicated by the scale. Similar scales are also attachable to an inside rear view mirror or to the outside rear view mirrors of a tractor to provide guide means for the same purposes.

3,670,424
RECOVERY OF ADSORBATE FROM ACTIVATED CARBON

Lawrence John Edward Hofer, Pittsburgh, Pa., and Milton Manes, Kent, Ohio, assignors to Calgon Corporation, Pittsburgh, Pa.

Filed March 15, 1971, Ser. No. 124,535
Int. Cl. F26b 5/00
U.S. Cl. 34—009 **10 Claims**

The removal of an adsorbate from activated carbon in order to use or further process the adsorbate is accomplished by (1) the use of a displacing medium having a refractive index of at least 1.5 and which is greater than the refractive index of the adsorbate, or (2) the use of a displacing medium having a refractive index greater than or of at least 1.5 together with or followed by a solvent for the adsorbate. The adsorbate is recovered in the form of a solution in the solvent.

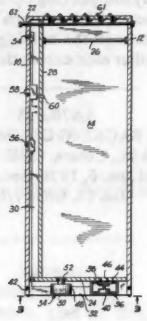
3,670,425
CLOTHES REJUVENATOR

Rose Ellen Benjamin, 48 Marshall Road, and Ann Hudis, 63 Ridge Drive, both of Yonkers, N.Y.

Filed Feb. 11, 1971, Ser. No. 114,620
Int. Cl. F26b 21/06
U.S. Cl. 34—46 **4 Claims**

A steamer-dryer and clothes rejuvenator for clothes comprises an enclosure for a blower-heater and a vaporizer which are operable to admit steam and a heated current of air to a cabinet. A control enclosure is also provided in the cabinet

housing controls which automatically control the operation of the heater-blower and the vaporizer. The steam from the

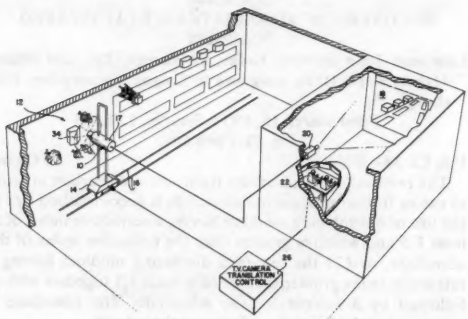


vaporizer steams out creases as garments hang in the cabinet while the heated current of air dries and sanitizes damp, limp, and musty clothing.

ERRATUM

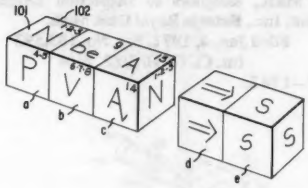
For Class 35—8 A see:
Patent No. 3,670,472

3,670,426
OPTICAL PROBE
Donald J. Horowitz, Santa Clara, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Aug. 17, 1970, Ser. No. 64,224
Int. Cl. B64g 7/00; G09b 9/08
U.S. Cl. 35—12 N **6 Claims**



An optical probe having simplified and optically improved means for obtaining movement of the field of view attitude and perspective. High light efficiency, optical resolution and depth of focus are provided, together with a substantial reduction in the number of optical and mechanical elements as compared to conventional visual flight simulation systems. A television camera has its field of view through a minor portion of the field of view of an extremely wide angle lens, and relative movement between the lens and the television camera provides a viewing attitude and perspective change without requiring tilting of the television camera or lens.

3,670,427
LANGUAGE TEACHING APPARATUS AND METHOD
Beulah Harris Stolpen, 282 North Ave., Westport, Conn.
Continuation-in-part of Ser. No. 774,949, Nov. 12, 1968, abandoned. This application Feb. 17, 1971, Ser. No. 116,042
Int. Cl. G09b 1/34
U.S. Cl. 35—35 J **14 Claims**



Apparatus and method for teaching the system of language, its sounds and structure, including a plurality of structured, multi-faceted or facially incremented units, bearing on at least one surface or increment indicia representative of a pattern element comprising functional labels of the parts of speech, a morpheme element comprising semantic and syntactic factors of the language, a phonogram element comprising letters and combinations of letters, a phonemic alphabet and corresponding graphemes, each element being cross-referenced and interrelated to another element; and structured exercises, structured cards, structured games, and structured audio-devices cross-referenced to elements of the multifaceted units.

3,670,428
CLOCK SCALE DEMONSTRATOR
Maurice B. Hall, Boulder, Colo., assignor to Harold F. Bowling, Ft. Collins and Edward E. Gitlin, Longmont, Colo.
Filed Dec. 28, 1970, Ser. No. 101,506
Int. Cl. G09b 19/12
U.S. Cl. 35—39 **6 Claims**

A clock scale demonstrator especially useful for teaching children to tell time. Separable hour and minute dials, each having a manually movable hand, enable the instructor to demonstrate and explain hour and minute readings separately. The two dials may be mounted in aligned superposed relationship with each other to demonstrate how the two individual readings are then combined with each other, one of the dials being constructed of a transparent material so that the scale and hand of the second dial can be observed when the two dials are superposed.

3,670,429
SOLE FOR FOOTWEAR HAVING MEANS TO VENTILATE THE FOOTWEAR INTERIOR

Raphael-Pierre Androsiglio, Parc "La Castorette"-Villa II Traverse de la Jarre 13, Marseille 9 eme, France

Filed June 25, 1970, Ser. No. 49,821

Claims priority, application France, June 25, 1969, 6922092

Int. Cl. A43b 7/06

U.S. Cl. 36—3 B **8 Claims**

A sole for an article of footwear comprises a heel portion composed of resilient material and a toe portion. A cavity is provided in the resilient heel portion and air passages extend interiorly of the sole from the heel portion to the toe portion and open at the heel end into the cavity. A series of toe openings are provided in the toe portion of the sole communicating the interior toe area of the footwear article with the air passages and a series of heel openings are provided in the heel portion of the sole communicating the interior heel area of the footwear article with the air passages whereby alternate compression and expansion of the resilient heel portion occurring during normal use of the footwear article alternately forces air out and into the cavity via the toe and heel openings to accomplish ventilization of the footwear article.

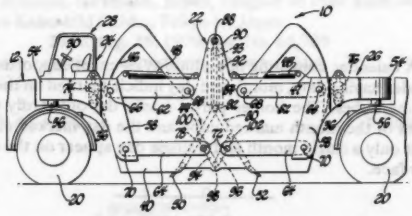
3,670,430
SCRAPER

Janis Mazzarins, Macedonia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1970, Ser. No. 90,624

Int. Cl. E02f 5/00, 3/62

U.S. Cl. 37—127 **3 Claims**



An earthmoving scraper having a front drive unit and a rear drive unit and a scraper bowl located therebetween. Both the front and rear drive units are steerable about vertical axes and the scraper bowl is open at opposite ends so that the scraper can be driven in either direction for loading the bowl. An ejector system is provided which serves to discharge material out of the bowl by gravity.

3,670,431
MOLE PLOUGH DEPTH CONTROL MECHANISM

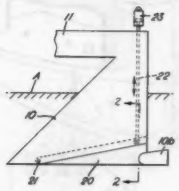
Ainsley Neville Ede, Cambridge, England, assignor to Hudswell Yates Developments Limited, Leeds, Yorkshire, England

Continuation-in-part of Ser. No. 715,469, March 8, 1968, abandoned. This application Sept. 25, 1970, Ser. No. 75,720

Claims priority, application Great Britain, March 10, 1967, 11,287/67

Int. Cl. E02f 5/18

U.S. Cl. 37—193 **7 Claims**



A mole plough having a plough blade rigidly secured to a support pivotally connected to a tracked carriage about a transverse horizontal axis, the blade having a rigid forward portion and a trailing foot portion pivotally connected thereto and means for tilting the foot portion relative to the remainder of the blade whereby the alteration of the angle of the undersurface of the foot portion and the reaction of the foot portion against the ground below the blade effects a change in the operating depth of the blade.

3,670,432
PRESSING MACHINE FOR GARMENTS

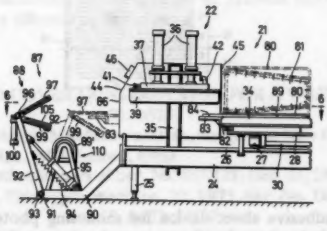
Wilhelm Engelbart, Heilbronn, Germany, assignor to Rheem International Inc., New York, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,924

Claims priority, application Germany, Dec. 13, 1969, P 19 62 611.0

Int. Cl. D06f 71/08

U.S. Cl. 38—22 **3 Claims**



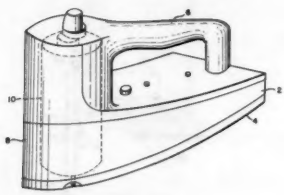
A pressing machine for garments in which at least two conjointly operated and aligned pressing forms are moveable between at least one pressing station and at least one mounting station so that while a garment is being pressed on one of the forms at the pressing station, an already pressed garment can be removed from the other form and a garment to be pressed mounted thereon at the mounting station.

3,670,433

AEROSOL CARTRIDGE FOR PRESSING IRONS

Peter D. Hardwick, Baboosic Lake Road, RFD #1, Amherst, N.H., and John J. Trombetta, 57 Plattsville Ave., Norwalk, Conn.

Filed Oct. 19, 1970, Ser. No. 81,668
Int. Cl. D06f 75/06
U.S. Cl. 38—77.3 1 Claim



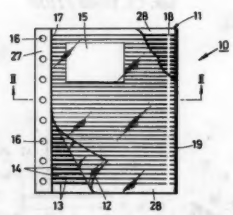
The aerosol cartridge is a cylindrical container adapted to be inserted into a recess in a pressing iron and having at its one end downwardly and outwardly directed tubes which communicate through passages in the pressing iron leading to the material being pressed, and having means at its other end for operating the aerosol container.

3,670,434

ADHESIVE DEVICE

Ryoji Shibata, and Seiichi Shibata, both of 45, 3-chome, Higashi, Takasi-cho, Higashi Sumiyoshi-ku,, Japan

Filed June 15, 1970, Ser. No. 46,285
Claims priority, application Japan, Oct. 8, 1969, 44/95463; Oct. 8, 1969, 44/95464; Oct. 9, 1969, 44/95886
Int. Cl. G09f 11/06
U.S. Cl. 40—104.18 17 Claims



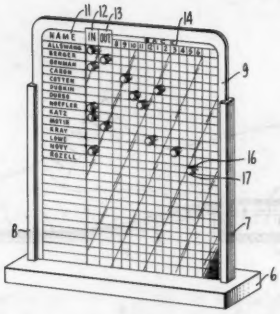
An adhesive sheet device for mounting photographs and other display items in albums, scrapbooks and the like, is provided including a relatively thick backing sheet and a relatively thin film of pressure-sensitive adhesive coating one surface of the backing sheet. A substantially uniplanar cover sheet of transparent material is disengageably adhered to the coated surface of the backing sheet for insertion of an item beneath the cover sheet for clear viewing of the item through the transparent cover sheet. The backing sheet is provided with means for eliminating the tendency of the sheet to buckle or warp when the cover sheet is repeatedly engaged with and disengaged from the backing sheet under pressure.

3,670,435

MAGNETIC IN AND OUT BOARD

William A. Steward, Somerset, Calif., assignor to Wm. A. Steward Company

Filed Oct. 27, 1970, Ser. No. 84,339
Int. Cl. G09f 19/02
U.S. Cl. 40—106.45 1 Claim



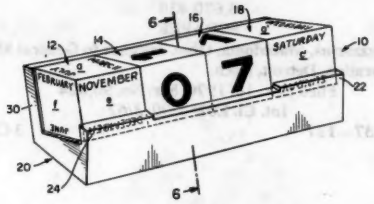
An "in and out" device is provided for indicating the whereabouts of the various personnel such as their availability on the premises or when they will return.

3,670,436

CUBE CALENDAR

Joel Weissman, Passaic, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.

Filed April 17, 1970, Ser. No. 29,407
Int. Cl. B42d 5/04
U.S. Cl. 40—107 2 Claims



A calendar consisting of a plurality of cubes supported by a holder having date, month and day indicia marked on the sides of the cubes. The holder partly masks the outwardly facing sides of the month marked cube and the day marked cube so that only a single month and a single day appear on the calendar face.

3,670,437

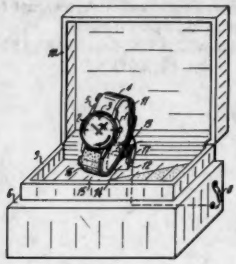
WATCH DISPLAY CASE

Andre Brien, Rue Germain, 3110, Fabreville, Ville de Laval, Quebec, Canada

Filed June 23, 1970, Ser. No. 49,060
Claims priority, application Switzerland, July 8, 1969, 10384/69
Int. Cl. G09f 19/00
U.S. Cl. 40—126 B 4 Claims

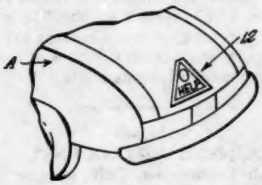
A display case for a wrist watch provided with dial illuminating means comprises a pedestal which houses means,

such as an electronic multivibrator circuit, for intermittently



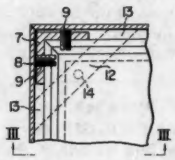
actuating the dial illuminating means. The watch can be pivotally supported in a case on the pedestal.

3,670,438
AUTO TRAVEL TROUBLE SIGN
John Robert Carroll, 332 Arlington; John Michael Kinlry, 107 Maple Drive, both of Satellite Beach, and Anthony Finazzo, 108 Snead Road, Indian Harbour Beach, all of Fla.
Filed June 29, 1970, Ser. No. 50,680
Int. Cl. G09f 7/00
U.S. Cl. 40—129 C **1 Claim**



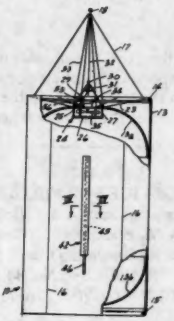
Sign means including a plastic sign plate emboss formed of thin sheet plastic and having raised luminescent lettering forming a word for communicating a message of distress or information. The sign means includes a permanent magnet strip fixed to the backside of the sign plate for temporary attachment thereof to the exterior surface of a wrecked or stalled automobile on a highway or thoroughfare.

3,670,439
DEVICE FOR FIXING ARTICLES IN FRAME STRUCTURES
Akira Shimizu, Hiratsuka, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo-to, Japan
Filed Aug. 25, 1970, Ser. No. 66,709
Claims priority, application Japan, Aug. 26, 1969, 44/81425
Int. Cl. G09f 1/12
U.S. Cl. 40—156 **7 Claims**



A number of parallel grooves are formed in the inner wall surfaces of the side members of a frame, the grooves being parallel to the side members and being, in cross sectional view, in a row perpendicular to the plane of the frame, and a cross member is inserted at its ends in these grooves at each frame corner in a gusset-like manner and supports pressing means such as a tightening screw or a spring which presses against an article such as a picture thereby to hold and fix the same in the frame.

3,670,440
INFLATABLE DISPLAY
Paul E. Yost, 1000 Tomar Lane, Sioux Falls, S. Dak.
Filed Feb. 25, 1970, Ser. No. 14,014
Int. Cl. G09f 21/12
U.S. Cl. 40—215 **20 Claims**

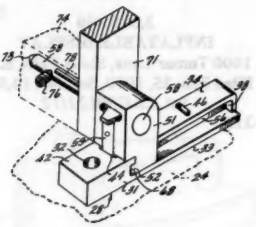


An inflatable display employs apparatus for continuously blowing air into a bag-like member on which may be carried a selected advertisement. The blower apparatus and the bag-like member may be connected to a frame structure at the upper end of the tube, the frame structure being adapted for connection to a tow line of an airborne vehicle. The shape of the member forms a part of the advertisement, such as a can, a bottle, or character and in one embodiment includes an inner liner spaced from the ends of the tube so that the ends of the tube may retain the definite selected shape thereof and are prevented from taking on a ballooning appearance. The liner balloons within the tube but does not change the exterior shape thereof. In another embodiment the blower apparatus is connected to a manifold for distributing a flow of air to a plurality of side-by-side connected open-ended tubes which form a three-dimensional display. As a static display the inflated member is anchored to the ground to prevent movements which may be effected by the wind.

3,670,441
HINGED COVER CONSTRUCTION FOR A WATER CLOSET
George W. Blount, Middletown, Ohio, assignor to New Century Products, Inc., Middletown, Ohio
Continuation-in-part of Ser. No. 887,129, Dec. 22, 1969, abandoned. This application Jan. 22, 1971, Ser. No. 108,844
Int. Cl. A47k 13/12
U.S. Cl. 4—236 **6 Claims**

A hinged cover construction for a water closet in which stationary brackets mounted adjacent the bowl are provided with tracks extending between the tank and the bowl, hinge supports move on the tracks toward and away from the tank between a normal position adjacent the tank and an advanced position spaced from the tank and can be held in both positions. A lower cover and an upper cover are pivotally mounted on the hinge supports. A resilient cushion is mounted on the lower cover. The covers swing between a lowered position in which the bottom cover is supported on an upper edge of the

bowl and the upper cover rests on the cushion and a raised position in which the covers lean against the tank in stable position when the hinge supporting brackets are in advanced position. Slots in the tracks permit removal of the hinge supports and covers from the bowl. Lock slide members are provided on the hinge supporting brackets for selective engagement with lock slots on the tracks to hold the hinge support in either the normal position or the advanced position.



3,670,442

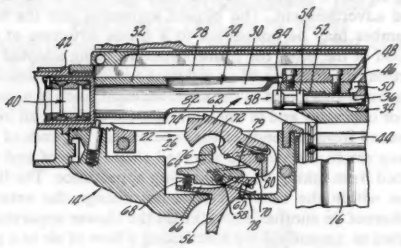
SAFETY DEVICE FOR FIREARMS

Ralph C. Kennedy, Wapping; Paul A. La Violette, Haven, both of Conn., and Henry M. Stromberg, Ellicott City, Md., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Oct. 28, 1970, Ser. No. 84,653

Int. Cl. F41c *17/08*, *17/00*

U.S. Cl. 42—70 F **7 Claims**



A firearm has a receiver incorporating a longitudinally reciprocatable bolt assembly which is movable between retracted or recoil and battery positions in the receiver. A trigger, including a sear, is pivotally mounted in the receiver. A hammer is pivotally mounted in the receiver in such a manner that movement of the bolt from the battery position to the recoil position urges the hammer into a cocked position. The hammer includes a first sear abutment to engage a sear on the trigger, a second sear abutment and a bolt stop sear abutment. A disconnector is pivotally mounted on the trigger pin. A compression spring is interposed between the rearward extremities of the disconnector and the trigger to urge the forward portion of the disconnector into contact with the top surface of the trigger. The disconnector includes a hook sear abutment on an intermediate portion which is adapted to engage the second sear abutment on the hammer when the trigger is in a depressed position. Should the disconnector or hook sear be removed from the firearm, the bolt stop sear abutment on the hammer is adapted to engage the bolt assembly during movement from the recoil position to the battery position for preventing the conversion of the firearm into a machine gun.

3,670,443

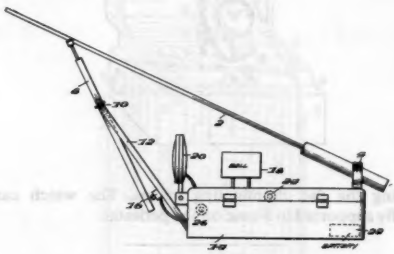
ALARM HOLDER FOR FISHING RODS

Richard G. Federline, Thurmont, Md., assignor to Don Eugene Webb, Thurmont, Md., a part interest

Filed Nov. 2, 1970, Ser. No. 86,157

Int. Cl. A01k *97/12*

U.S. Cl. 43—17 **5 Claims**



An arm extending upwardly at an acute angle from the end wall of a tackle box has pivoted on it, with slight frictional engagement, a bar which extends on both sides of the pivot. The hinged top of the box carries at its end remote from the arm a clamp for holding the butt of the rod. The bar normally occupies a position at a slight angle to the angle of the support, and at its upper end has a fork which is adapted to engage the stem of a fishing rod. Opposite the lower end of the bar, and carried by the support, is a microswitch or the like which when pressed closes an electrical circuit. Closing of the electrical circuit, which occurs when a fish has hooked onto the line, rings a bell and simultaneously lights a light.

3,670,444

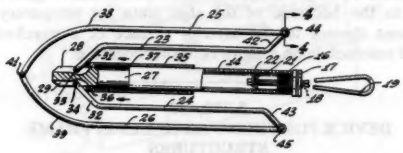
FOLDING HAND TROUT NET

Frank L. Dieterich, Los Angeles, Calif., assignor to James A. Barnett, Los Angeles, Calif., a part interest

Filed July 13, 1970, Ser. No. 54,375

Int. Cl. A01k *77/00*

U.S. Cl. 43—12 **13 Claims**



A folding hand fish landing net, including a handle and frame arms, pivotedly connected together and to the handle so as to be foldable at opposite sides of the handle into a compact unit about which the bottom of the net may be wrapped for easy carrying and storage. The frame arms open out into a frame loop to which the top of the net is attached. The handle is provided with a spring-biased, manually retractable locking sleeve on its forward end, and the frame arms pivoted to the handle are disposed in slots in the forward end thereof when the frame is extended, the sleeve being automatically moved by its spring past the arm pivots into locking position.

3,670,445

FISH HOOK GUARD

George Frederick Borger, 308 W. 49th St., New York, N.Y.

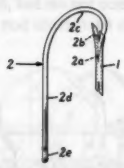
Filed Feb. 5, 1971, Ser. No. 112,939

Int. Cl. A01k *97/06*

U.S. Cl. 43—42.4 **8 Claims**

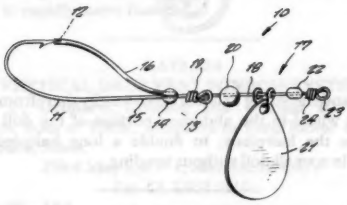
A guard for a barbed fish hook comprises a length of clear vinyl tubing having an internal diameter slightly less than the

maximum cross sectional dimension of the hook at the point of the barb. The ends of the tubing are cut off at an angle of



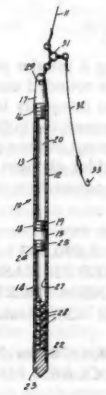
about 35° and slits are provided in opposite sides of the end portion midway between the high and low parts of the inclined end surface.

3,670,446
WEEDLESS HOOK AND LURE
Daniel B. Wheeler, 271 Remsen Ave., New Brunswick, N.J.
Filed April 7, 1970, Ser. No. 26,310
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.19 **6 Claims**



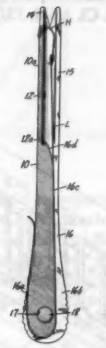
An improved fishing tackle comprising a weedless hook incorporating a flexible guard with braided filament core and an outer skin or coating of plastic, having an end thereof receivable over a hook tip and a lure comprising a weedless spinner, the spinner being fixed whereby a fish may not be able to set off the weed guard thus slipping the end thereof off the hook tip.

3,670,447
NON-SNAGGING FISHING DEVICE
Michael J. Wohead, R. R. 2, Box 12, Naperville, Ill.
Filed May 18, 1970, Ser. No. 38,314
Int. Cl. A01k *95/00*
U.S. Cl. 43—43.14 **5 Claims**



A non-snagging fishing device for use as a sinker for a fishing line characterized by an elongated tubular body having a flotation portion adjacent one end and the weight concentrated adjacent the other end so that it assumes a substantially upright position in the water. The device is preferably provided with a chamber adjacent the weighted end to receive additional weight to increase the weight of the device. In one embodiment, the body portion is provided by a pair of plastic tubular sections interconnected by a coupling device to enable breakdown for storage and transportation.

3,670,448
FISH HOOK LOCATOR-EXTRACTOR
Thomas R. Wehmeyer, 639 10th Ave., New York, N.Y.
Filed Feb. 17, 1971, Ser. No. 116,062
Int. Cl. A01k *97/00*
U.S. Cl. 43—53.5 **10 Claims**



A fish hook locator-extractor for locating and extracting a fish hook that has been swallowed by a fish comprises an elongated shank having a rounded pear-shaped handle at one end. The opposite end portion of the shank is hollow and terminates in a plurality of longitudinally extending, circumferentially spaced rounded projections separated by sharp V-shaped recesses. A longitudinal slot opens into said hollow in alignment with one of said recesses and a groove extends longitudinally along the shank from the slot to and over the end of the handle. A removable cross bar extends through a transverse bore in the handle portion.

3,670,449
CONSTRUCTION ELEMENT TOY
Jack L. Lemkin, Cincinnati, Ohio; Gerard K. Leistikow, Hermosa Beach, Calif.; Russell C. Edmisson, Manhattan Beach, Calif., and John T. Benson, Los Angeles, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed March 4, 1971, Ser. No. 121,053
Int. Cl. A63h *33/04*
U.S. Cl. 46—23 **12 Claims**

Toy construction elements including a cone-shaped element and block-shaped element that can be readily joined into in-

teresting shapes. Both the narrow and wide ends of the cone-shaped element have projections, and have recesses for receiving projections, the recesses at the wide end being formed by a pair of concentric flanges. The block-shaped element is formed from a substantially flat member divided by living hinges into six face portions that can be folded into a block. Each free edge of a face portion has an inwardly-extending rib and a stepped recess so that when the pair of ribs of adjacent edges are received in corresponding recesses the face elements are locked together.

3,670,450

TOY ASSEMBLY PLANT FOR VEHICLE

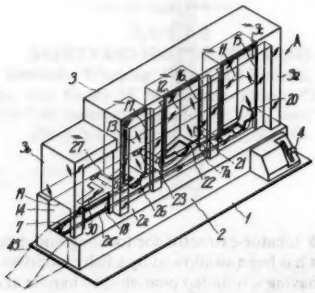
Teruo Morosawa, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1970, Ser. No. 86,649

Claims priority, application Japan, Dec. 26, 1969, 44/656

Int. Cl. A63h *33/30*

U.S. Cl. 46—40 **9 Claims**



A toy comprising, in combination, an assembly plant and elements so constructed as to be assembled into a vehicle in superimposed relationship by the assembly plant. The assembly plant is equipped with a motor-driven conveyor for conveying the elements to the delivery side thereof and also with devices capable of automatically assembling the elements into a vehicle in co-operation with the moving conveyor in the course of conveyance of the elements.

3,670,451

ADJUSTABLE HAIR DOLL

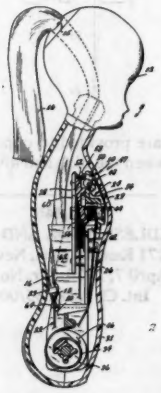
Sydney L. Groves; Frank J. Kuchta, both of Redondo Beach; J. Stephen Lewis, Pacific Palisades; Donald J. Maurer, Torrance; Richard L. May, Manhattan Beach; John W. Ryan, Los Angeles, and Colin Vowles, Santa Monica, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 9, 1970, Ser. No. 9,708

Int. Cl. A63h *11/00*

U.S. Cl. 46—135 **18 Claims**

A fashion doll with a fall-type hairpiece which can be adjusted in length without the necessity for knobs, buttons, or the like on the outside of the doll. The apparatus includes a string having an inner end wound on a wheel within the doll and an outer end tied to an end of the hairpiece which is within the doll. A spring urges the wheel to rotate in a direction to shorten the apparent length of the hairpiece. The wheel has several recesses spaced about its axis of rotation, and a ball is normally disposed partially within a recess on the wheel and another recess on a wheel-supporting frame, to lock the position of the wheel when the doll is up-right. However, turning of the doll to a face down position causes the ball to fall completely into the frame recess, to release the wheel so it can retract the hairpiece into the head as far as it is allowed to retract by a child who holds the outer end of the hairpiece. The wheel which winds up the string is located in the chest of



the doll, and the string extends downwardly therefrom, around a second wheel in the abdomen portion of the doll and upwardly to the hairpiece, to enable a long hairpiece to be received in a small doll without tangling.

3,670,452

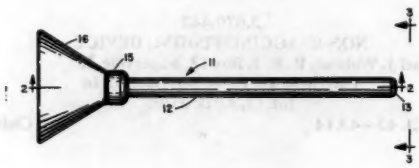
TURKEY CALL

William A. Turner, 205 Sycamore Road, Franklin, Va.

Filed March 19, 1971, Ser. No. 126,047

Int. Cl. A63h *5/00*

U.S. Cl. 46—178 **1 Claim**



A turkey call including a tubular stem element formed of hard plastic and having a rounded end as well as including a hard plastic bell element integrally interconnected with the other end of the stem element; the hollow interiors of the stem element and the bell element of the call being in communication. A reinforcing shoulder element is externally integrally provided at the point of connection of the stem and bell elements of the turkey call.

3,670,453

TOY AND DELAYED RELEASE PROPELLING MECHANISM THEREFORE

Enrique A. Cosp, Jejui 438, Asuncion, Paraguay, South America

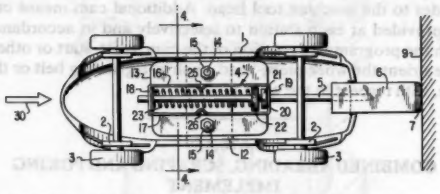
Filed Sept. 4, 1970, Ser. No. 69,812

Int. Cl. A63h *11/10*

U.S. Cl. 46—202 **4 Claims**

A toy having a spring driven propelling mechanism including an axially movable rod which is propelled to the rear of the vehicle by the spring and which, when the vehicle is placed

against a vertical barrier, propells the vehicle forward by reaction force. The delayed release mechanism includes a frame having parallel sides and end walls in which the rod is journaled for axial movement. The sides have indentations which extent inwardly toward, but do not contact, the rod and its surrounding spring. The rod carries an elastic member which is



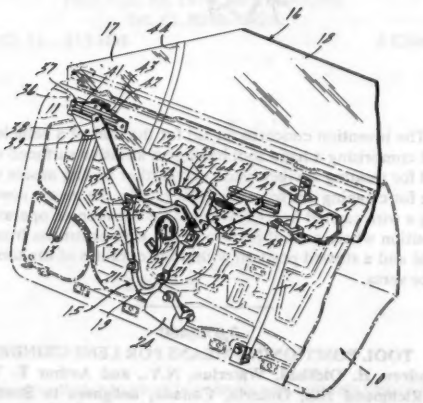
pushed forwardly of the indentations when the spring is compressed. The spring gradually forces the elastic member past the indentations and, when the elastic member is clear of the indentations, the spring is permitted to rapidly expand, suddenly causing the rod to move toward the barrier, causing the vehicle to rapidly move forward.

3,670,454

VERTICAL DROP VENT WINDOW SYSTEM

Harold C. Gebhard, Livonia, and William B. Schueren, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 3, 1971, Ser. No. 139,479
Int. Cl. E05f 5/10
U.S. Cl. 49—103 **16 Claims**



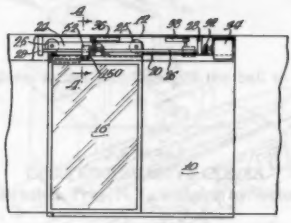
A window regulator mechanism for raising and lowering in a window opening in a vehicle body structure a window panel vertically divided into a ventilation section and a visibility section. The window regulator mechanism may be manually or power operated to function to raise or lower both panel sections in controlled sequence. With the window panel in raised condition, actuation of the window regulator mechanism results in the ventilation or smaller panel section being lowered into the body structure to provide a ventilation exhaust opening. During the travel of the ventilation section into the body structure, the visibility or larger panel section remains locked in a fully raised position by a latch mechanism. When the smaller panel section reaches a predetermined down position, the latch mechanism is released allowing the larger panel section to travel to a full down position. Upon movement of the window panel from its lowered position to a raised position, a reverse sequence occurs during which the larger panel section again first becomes locked in a fully raised position as the smaller panel section continues to move out of the body structure into its fully raised position.

3,670,455

SLIDING DOOR OPERATOR

Loren E. Slaybaugh, Arlington Heights, Ill., assignor to Republic Industries, Inc., Chicago, Ill.

Filed March 15, 1971, Ser. No. 124,239
Int. Cl. E05f 15/14
U.S. Cl. 49—360 **19 Claims**



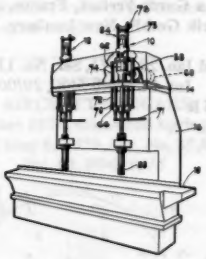
A sliding door operator incorporating a rotating shaft and means on the door to be moved including opposing rollers engaging the shaft with their axes parallel to the shaft when the door is stationary and with their axes displaced from their parallel position in either direction to effect a helical engagement of the rollers on the shaft for door movement in either direction.

3,670,456

HONING TOOL ARRANGEMENTS

Anthony James Harratt, Werrington, England, assignor to Hi-Ton Machine Tools Limited, Selly Oak, Birmingham, England

Filed Jan. 18, 1971, Ser. No. 107,034
Int. Cl. B24b 7/00
U.S. Cl. 51—34 D **14 Claims**



A honing tool arrangement which includes a tubular shaft to one end of which can be attached a honing tool and the tubular shaft and the honing tool are capable of being reciprocated and rotated, a control rod in the tubular shaft and associated with a piston and cylinder device to cause fast feed longitudinal movement of the control rod relatively to the tubular shaft to cause fast increase and decrease of the effective cutting diameter of the honing tool and disengageable screw means between the tubular shaft and the control rod and rotational brake means associated with the control rod and capable of "braking" the rotation of the control rod relative to the tubular shaft when the screw means is engaged to cause slow feed longitudinal movement of the control rod relative to the

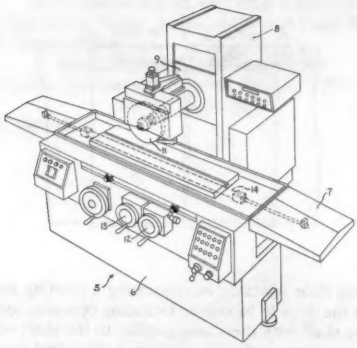
tubular shaft and thus to cause a slow increase and decrease of the effective cutting diameter of the honing tool.

3,670,457

ADJUSTABLE TRAVERSE CONTROL FOR SURFACE GRINDER

Gordon Berkholcs, Bloomington, Minn., assignor to Continental Machines, Inc., Savage, Minn.

Filed April 21, 1970, Ser. No. 30,520
Int. Cl. B24b *47/06*
U.S. Cl. 51—92 R **7 Claims**



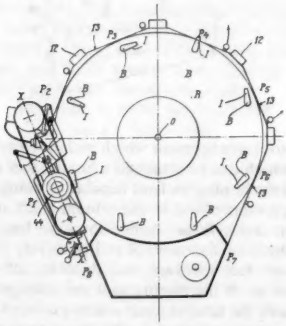
The stroke of reciprocation of a workpiece carrying table for a surface grinder is controlled by a pair of stationary control elements connected with the power drive for the table and adjustable in the directions of table motion, and a cooperating element fixed on the table. Proximity responsive control systems are disclosed. In one, each stationary element comprises a reed switch normally held closed by a magnet, and an iron vane carried by the table comes between the magnet and the reed switch at the end of the stroke.

3,670,458

PROGRAMMED CONTOURING MACHINE FOR MACHINING, BY TOOL HEADS, IRREGULARLY SHAPED WORKPIECES

Robert Faure, La Garde-Freinet, France, assignor to ACME Maschinenfabrik GmbH, New Isenburg, Rathenaustr, Germany

Filed Jan. 28, 1971, Ser. No. 110,495
Int. Cl. B24b *5/00, 29/00*
U.S. Cl. 51—135 R **16 Claims**



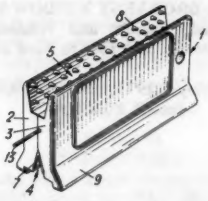
A turret table, indexed by an indexing mechanism, carries along its circumference a plurality of work piece spindles on which work pieces, to be shaped, may be mounted. Fixed beneath the turret are a plurality of cams, one group of cams for each work station, which are revolved synchronously. A cam follower on one cam acts to deflect track portions of a roughly circular, articulated endless track. Each spindle is linked to a runner, running on the track which, as it is deflected by the cam follower, transfers deflecting motion to the spindle to present the work piece in predetermined attitudes to the machine tool head. Additional cam means can be provided at each station to selectively and in accordance with the programmed rotation of the cam, twist, start or otherwise orient the work piece head, such as a grinding belt or the like, with respect to the work piece.

3,670,459

COMBINED ABRADING, SCRAPING AND POKING IMPLEMENT

Derek Edwin Welton, Sittingbourne, England, assignor to Waso Limited, Sittingbourne, Kent, England

Filed April 2, 1971, Ser. No. 130,614
Claims priority, application Great Britain, April 3, 1970, 16,008/70
Int. Cl. B24d *15/02*; B60s *1/04*
U.S. Cl. 51—181 R **5 Claims**



The invention concerns an aid for the user of a vehicle, the aid comprising a hand tool having an abrasive surfaced channel for treating a wiper blade and further having means suitable for cleaning dirt from a washer nozzle, the means comprising a wire carried by a slider movable between an operational position where an end portion of the wire protrudes from the tool and a stowed position within the confines of the tool and vice versa.

3,670,460

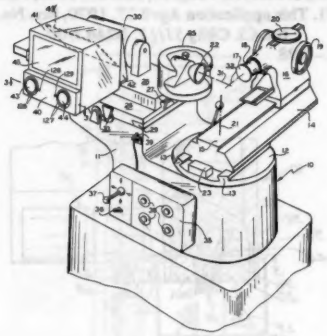
TOOL POSITIONING MEANS FOR LENS GRINDER

Andrew H. Oldfield, Waterloo, N.Y., and Arthur F. Trott, Richmond Hill, Ontario, Canada, assignors to Senoptics, Inc., Waterloo, N.Y.

Filed June 1, 1970, Ser. No. 42,125
Int. Cl. B24b *49/12*
U.S. Cl. 51—165.71 **9 Claims**

A toric lens grinding machine has means for swinging a lens blank past a cup-shaped grinding wheel and in contact therewith, the wheel being mounted on crossed slides. A computer device secured to the wheel carrying slide has a transparent portion overlying an upward beam of light fixed on the machine base. The computer has first dial means marked in diopters for setting an aiming tube so as to be movable along a straight line calculated to determine the base curve of the ground lens. Second dial means marked in diopters are provided for moving the aiming tube along the straight line a calculated distance for determining the cylinder curve of the ground lens. A valve connected to hydraulic motor means for moving the crossed slides has a single lever for moving both slides so that the wheel is moved in a single direction deter-

mined by the direction the lever is moved so that the aiming tube and beam of light may be quickly aligned to position the wheel in the machine for grinding the toric lens set on the di-



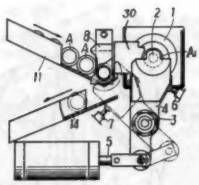
als. The aiming tube is illuminated and a mirror overlying the computer device projects images of the tube and light beam on a translucent screen at the side of the machine.

3,670,461

FEEDING DEVICE FOR MACHINE TOOLS

Takashi Hori, Nakayamadera, Japan, assignor to Osaka Seiki Works, Ltd., Osaka, Japan

Filed Sept. 18, 1970, Ser. No. 73,383
Int. Cl. B24b *47/20*
U.S. Cl. 51—215 HM **6 Claims**



This invention is to provide a simple and accurate device for automatically feeding workpieces one by one in order in a systematic manner to an operating part on one of the various kinds of machine tools, such as, the grinding machine, the super-finishing machine, the honing machine, lapping machine and so forth, and for delivering the finished workpieces to a predetermined place.

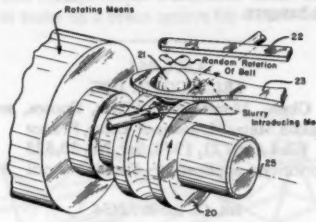
3,670,462

LAPPING OF BALL BEARING RACEWAY

John F. Robinson, Newport Beach, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Division of Ser. No. 746,575, July 22, 1968, abandoned. This application Sept. 2, 1970, Ser. No. 69,096
Int. Cl. B24b *1/00*
U.S. Cl. 51—291 **4 Claims**

A method and apparatus for randomly lapping a ball bearing race and removing the deviations from a smooth cross race curvature wherein the bearing race is rotated about its nominal center, a conforming ball in a slurry of fine abrasives is rotated in a highly random manner in the race thus transfer-



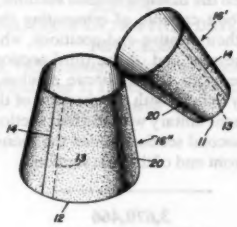
ring the uniform radius and finish of the ball to the bearing race surface.

3,670,463

COATED ABRASIVE CONES

Warren E. Christian, Troy, N.Y., assignor to Norton Company, Troy, N.Y.

Filed March 8, 1971, Ser. No. 121,918
Int. Cl. B24d *17/00, 11/00*
U.S. Cl. 51—394 **7 Claims**



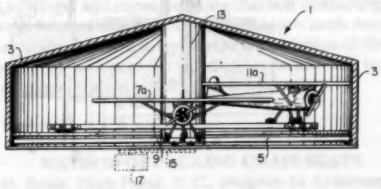
A flexible abrasive tool having a conical shape is provided with tear means whereby the tool can be separated, if desired, into two or more abrasive tools of the same conical shape but of lesser desired vertical height.

3,670,464

AIRCRAFT HANGARS

Robert C. Cutter, Box 1074, Glenwood Springs, Colo.

Filed May 6, 1970, Ser. No. 35,067
Int. Cl. E04h *6/16*
U.S. Cl. 52—30 **19 Claims**



A circular hangar for aircraft with at least two decks having a central rotating support pillar supporting the decks for rotation. The decks are support tracks extending radially from the pillar, with the tracks for adjoining decks close together, but staggered vertically an amount sufficient for the wings of air-

craft on the decks to clear. A clustered assembly includes two of the hangars with a single elevator positioned between them so as to serve both. The hangars closely pack the aircraft, providing increased and efficient land use without undue height of the hangars.

3,670,465
TELESCOPIC JIBS

Bernard J. Cheze, Montceau-les-Mines, France, assignor to Potain Poclain Materiel, Saone-et-Loire, France

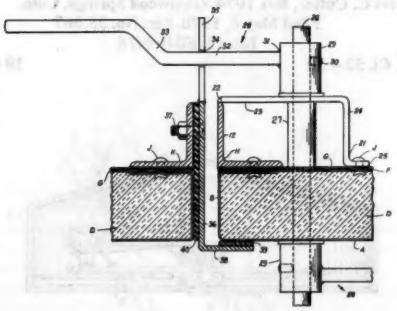
Filed April 21, 1970, Ser. No. 30,523
Claims priority, application France, April 21, 1969, 6912472
Int. Cl. E04h *12/34*
U.S. Cl. 52—115 **4 Claims**

This invention relates to a locking device for a telescopic jib constituted by at least three sections and by a motive member connected between the first and second sections, and comprising at least one bolt capable of integrating the second and third sections in their relative end positions, wherein this bolt is arranged on the rear end of the third section and may be selectively inserted into at least three catches, said catches being respectively unitary with the rear end of the second section, with an element unitary with the first section and with the front end of the second section, whilst the second catch is arranged near the front end of the first section.

3,670,466
INSULATED PANEL

Earl D. Lynch, Greenville, S.C., assignor to Metal Products Corporation, Greenville, S.C.

Filed Aug. 3, 1970, Ser. No. 60,665
Int. Cl. E04b *1/76*
U.S. Cl. 52—204 **2 Claims**

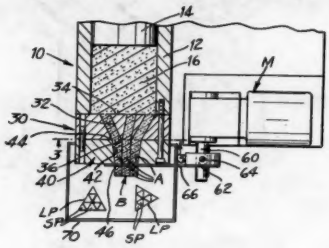


An insulated panel for use in fabricating building structures wherein fastening strips are utilized in combination with rivets to create a panel that is rigid and has no metal to metal contact between a metallic inner wall and a metallic outer wall.

3,670,467
METHOD AND APPARATUS FOR MANUFACTURING TUMBLING MEDIA

Robert H. Walker, 72 Tory Fort Lane, Worcester, Mass.

Division of Ser. No. 701,310, Jan. 29, 1968, Pat. No. 3,568,251. This application April 27, 1970, Ser. No. 32,201
Int. Cl. C08g *51/12;* **B24d** *3/00*
U.S. Cl. 51—298 **5 Claims**

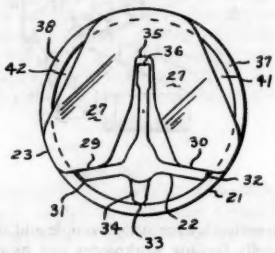


Extruding a plastic abrasive mix through a multi-hole die adapted to combine emerging strands of the mix into a single strand whereby the strands move at the same linear rate. The single strand is cut into large pellets of uniform length, after which they are divided into smaller pellets corresponding to the original number, size, and shape of each of the combined strands and cured.

3,670,468
WEDGE AND SUPPORT FOR A TEMPORARY FENCE

Hubert Cordell, Sr., 946 Fife Ave., Wilmington, Ohio

Filed Oct. 19, 1970, Ser. No. 81,944
Int. Cl. E02d *27/42*
U.S. Cl. 52—298 **3 Claims**



A removable wedge for inserting in the end of a pipe in engaging relationship with a removable conventional "T" fence post secures and aligns the post in the pipe.

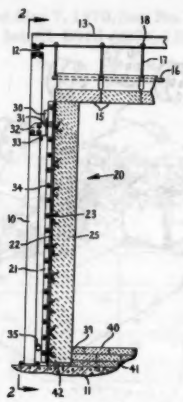
3,670,469
HANGING WALLS FOR FURNACE

Allen J. Jones, Fall Creek, Oreg., assignor to Michel Lumber Company, Lake Oswego, Oreg.

Filed July 20, 1970, Ser. No. 56,447
Int. Cl. E04c *1/40;* **E04b** *1/94*
U.S. Cl. 52—285 **2 Claims**

Wall panels are made of refractory material precast on metal frames. Hooks on the backs of the panels at their upper ends suspend the panels from rails in an exterior steel supporting frame. All of the vertical expansion of the panels from the

heat of the furnace occurs in a downward direction without disturbing the roof of the furnace. The lower ends of the wall panels are free to expand and contract vertically alongside the



edges of the furnace floor. All metal parts are maintained relatively cool by exposure to atmosphere on the outside of the furnace.

3,670,470

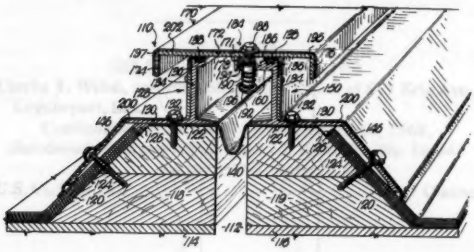
ROOF JOINT COVER ASSEMBLY

Wenzel W. Thom, Wichita, Kans., assignor to Architectural Art Mfg., Inc., Wichita, Kans.

Filed Dec. 18, 1970, Ser. No. 99,363

Int. Cl. E04d *3/38*; E04f *15/14*

U.S. Cl. 52—395 **15 Claims**



An expansion joint cover for effectively sealing the joint between two shiftable roof sections while permitting the natural expansion and contraction of the latter which employs a cover plate resiliently mounted on one of a pair of support members on opposite sides of the joint with a bolt and coil spring therearound so as to bias the cover into a sealing position on both supports, the bolt and spring being positioned proximal to the joint between the two sections and providing a balanced sealing action on the respective supports.

3,670,471

SECTIONAL TOWER STRUCTURE

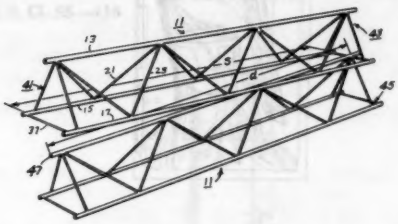
Van Z. Smith, Mineral Wells, Tex., assignor to All Products Company, Mineral Wells, Tex.

Continuation of Ser. No. 746,454, July 22, 1968, abandoned. This application May 12, 1970, Ser. No. 37,415

Int. Cl. E04h *12/10*; E04b *1/343*

U.S. Cl. 52—638 **1 Claim**

Readily transportable sectional tower structure of triangular transverse section, having three column members disposed in juxtaposed spaced relation, with brace systems permanently fixed between each of two of the column members and the other one, forming two sides of the section and constituting a V-trough-like configuration. Detachable brace members are provided to make up a brace system for a third side, when as-



sembled. With detachable brace members removed, tower sections can be stacked in nested relation. End brace members extending transversely of the two columns on the third side of the section may be used and are disposed so as not to interfere with stacking of the sections in nested relation.

3,670,472

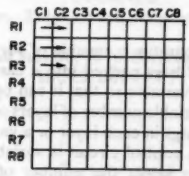
AUDIO-VISUAL CONCENTRATION DRILL AND PUZZLE PROCESS

Daniel Clifford, 7631 Eastlake Terrace, Chicago, Ill.

Filed May 7, 1970, Ser. No. 35,355

Int. Cl. G09b *5/04*

U.S. Cl. 35—8 A **14 Claims**



A method of inducing concentration of a listener being adaptable for learning or entertainment purposes, the method comprising a producing of a continuing display of audible and apprehensible matter translatable into numbers, letters, or other symbols, and superimposing thereon distracting sounds effective to particularly mask and obscure such matter, the listener being required to transcribe a translation of the matter into an array in a preselected manner which will indicate a level of concentration obtained by the listener.

3,670,473

METHOD OF PACKING CHAIR SEATS

Paul D. Bobb, High Point, N.C., assignor to Armstrong Cork Company, Lancaster, Pa.

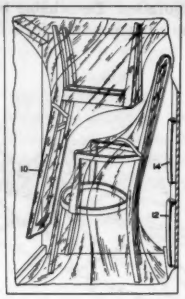
Filed Dec. 30, 1970, Ser. No. 102,600

Int. Cl. B65b *5/08*

U.S. Cl. 53—37 **2 Claims**

A chair pack is provided for storage of chairs and their protection during shipping. Initially, chair seats are not stored with the chairs since the seats will come with a number of dif-

ferent fabrics for each chair design. A flap opening is provided in the chair pack to permit the insertion of the chair seat into



the chair pack just prior to shipment of the unit to the consumer.

3,670,474

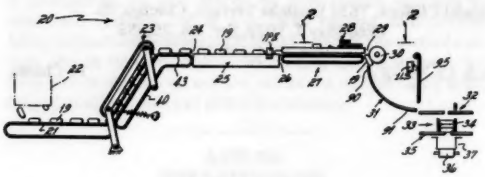
BAG PACKER

John W. Vieson, and William A. Baker, both of Cincinnati, Ohio, assignors to R. A. Jones & Co., Inc., Covington, Ky.

Continuation-in-part of Ser. No. 808,831, March 20, 1969, abandoned. This application March 3, 1971, Ser. No. 120,518

Int. Cl. B65b *57/02, 57/10*

U.S. Cl. 53—55 **9 Claims**



A bag packing apparatus is capable of varying the number and configuration of bags packed into a case. The packer is three-dimensionally variable so that it can be s et up to pack combinations of a variable number of layers of bags, a variable number of rows of bags in each layer or a variable number of bags in each row. A control circuit is variably switched to a desired condition to select the number of layers and the number of rows in each layer and a channelizer, movable guides and check and release units are adjusted to accommodate a desired number of bags in each row. Electronic variable timers are provided in the control circuit to time the operation of the various movable elements of the apparatus and may be adjusted to attain optimum performance. Detecting devices are utilized to sense the presence of the bags and the cases in their various positions and are connected so as to prevent malfunctions in the event that bags or cases are not in their predetermined positions at the proper time or in the event that the bags back-up beyond a predetermined point.

3,670,475

MACHINE FOR FORMING AND WRAPPING UP INDIVIDUAL ARTICLES SUCH AS CANDIES

Ariosto Seragnoli, Bologna, Italy, assignor to G. D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli, Bologna, Italy

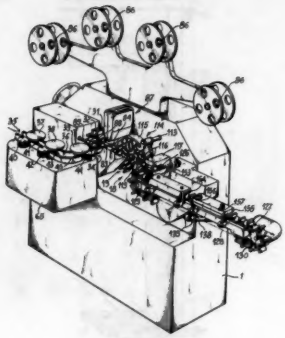
Filed Jan. 13, 1970, Ser. No. 2,640

Claims priority, application Italy, Jan. 15, 1969, 1509 A/69

Int. Cl. B65b *11/32, 11/42*

U.S. Cl. 53—234 **2 Claims**

An intermittently rotating radial section wheel transfers articles along a guideway from a first stop station to a second stop station. Lengths of wrapping material are successively and intermittently fed transversely of said guideway. At the second stop station an intermittently rotating radial pliers of a wrapping wheel bends the wrapping material in U-shape about



an article. During movement to an outlet station, the wrappings are folded over the article by wrapping members. Different types of wrapping can be carried out with different wrapping members.

3,670,476

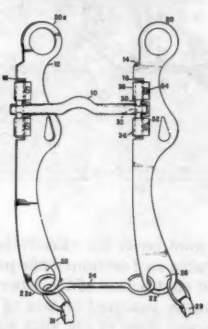
BRIDLE BIT HAVING IMPROVED MOUTHPIECE MOUNTING

James W. Parry, 373 Dominion Circle, Concord, Tenn.

Filed Dec. 18, 1970, Ser. No. 99,538

Int. Cl. B68b *01/06*

U.S. Cl. 54—8 **3 Claims**



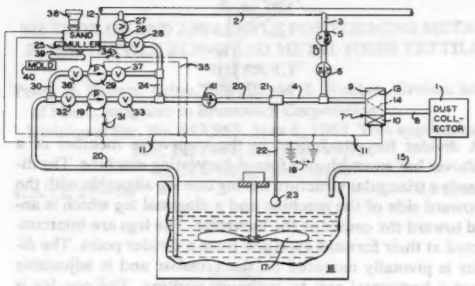
Improved mouthpiece mounting for a bridle bit including flat, elongated cheek pieces adapted to lie along the opposite cheeks of a horse or like animal and having a mouthpiece disposed transversely therebetween. A pin on each end of the mouthpiece is received within a T-shaped opening on each cheek piece, and rigid U-shaped clips engage the pins within these openings and connect opposite ends of the mouthpiece to the cheek pieces thereby permitting interchange of mouthpieces in the bridle bit. The clips maintain the pins in general alignment with the longitudinal axis of each cheek piece and also permit partial rotation of each cheek piece about the longitudinal axis of each pin. Means are provided for releasably joining the rigid clips to the cheek pieces.

3,670,477

SLUDGE RETRIEVAL APPARATUS FOR AIR POLLUTION CONTROL SYSTEMS

Jerry A. Carbo, Irwin, and Dennis F. Grady, Pittsburgh, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 7, 1970, Ser. No. 35,325
Int. Cl. B01d *46/04, 23/00*
U.S. Cl. 55—227 6 Claims



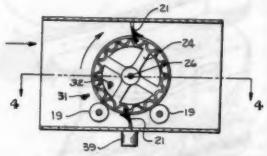
Apparatus for removing pollutants from pollutant-laden water discharged from a water type dust collector device, such polluted water being pumped from a collecting tank, where the pollutants are held in solution in the water by a mixer, to a water-using device, such as a foundry sand muller, which does not require pollution-free water and which, by its nature of operation, that is, when the pollutant-laden water is passed through the sand, effects removal of pollutants from the water thus discharging the water in a cleaner state than when it entered the muller.

3,670,478

SELF-CLEANING AIR FILTER

Clarke T. Welsh, and Billy M. Brumett, both of 611 Erie Ave., Logansport, Ind.

Continuation of Ser. No. 713,108, March 14, 1968, abandoned. This application June 24, 1970, Ser. No. 56,043
Int. Cl. B01d *29/02*
U.S. Cl. 55—242 7 Claims



An air duct section with a cylindrical drum of washable filter material therein cradled on rollers and rotatable by a drive motor, but normally at rest. Upper and lower seal brushes are mounted to the duct and engage the drum, and water spray nozzles are provided inside and outside the drum, with timer controls on the motor and supply to the spray nozzles for rotating and spraying the drum at selected intervals, to wash accumulated deposits from the filter to a drain.

3,670,479

MOMENTUM SLOT CENTRIFUGAL TYPE SEPARATOR

Lee H. Tomlinson, Schenectady, N.Y., assignor to General Electric Company

Continuation of Ser. No. 827,338, May 23, 1969, abandoned, and a continuation-in-part of Ser. No. 627,107, March 30, 1967, abandoned. This application Dec. 14, 1970, Ser. No. 98,098
Int. Cl. B01d *45/12*
U.S. Cl. 55—416 3 Claims

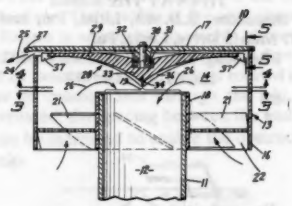
The main passageway has an annular extraction passageway in the wall thereof. The upstream surface of the annular passageway is contoured so that any fluid entering the annular passageway continues with its momentum unaltered to the exit end thereof. Such a surface is formed by the revolution about the axis of the main passageway of a straight line which is coincident in direction with the momentum of an element of fluid as it enters the annular passageway.

3,670,480

CLEANER

Ross K. Petersen, 3116 Girard Avenue South, Minneapolis, Minn.

Filed July 30, 1970, Ser. No. 59,445
Int. Cl. B01d *45/12*
U.S. Cl. 55—430 14 Claims



An apparatus for separating particulates, as dust, dirt, sand, snow and the like, from air being directed to an air cleaner of an internal combustion engine. The apparatus has a cylindrical housing surrounding a separation chamber. Located within the housing is a sleeve having a central outlet passage for carrying cleaned air from the chamber. A plurality of circumferentially spaced vanes attach the sleeve to the housing and provide an inlet passage open to the chamber for directing the air and particulates into the chamber. An impeller rotatably mounted on the top wall of the chamber has a plurality of circumferentially spaced blades. The blades are located in a contiguous relationship with respect to a second opening in the housing. Movement of air through the chamber causes the disc to rotate, whereby the blades pump air and particulates

out of the second opening. The rotating impeller produces a positive pressure at the point of discharge of the second opening to insure a flow of air carrying the particulates through the discharge opening.

3,670,481

MACHINE FOR HARVESTING SUGAR CANE

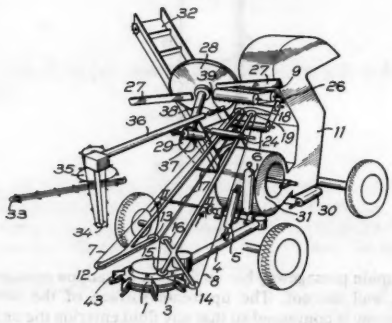
Albert Gustave Minet, Bellevue, rue Bir-Hakem 77, Le Mee sur Seine, France

Filed Sept. 30, 1968, Ser. No. 763,825

Claims priority, application France, Oct. 12, 1967, 67124293

Int. Cl. A01d *41/08*

U.S. Cl. 56—10.4 **10 Claims**



A machine to harvest sugar cane comprising a cutting disk to cut the standing cane. The disk is mounted on a convex shaped member gliding on the ground.

A chain assembly seizes the cut cane to lead it between two belts which introduce it in an airblast column.

At the entry of the airblast column, the cut cane is sliced sideways in the sense of movement of the cane.

In the airblast column the cane is stripped and then loaded in a pick-up cart while the wastes are left on the ground.

3,670,482

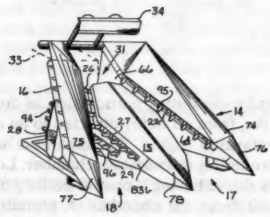
TWO ROW, ROW CROP ATTACHMENT WITH LOWER CROP GATHERING MEANS AT THE CENTER RATHER THAN AT THE SIDES

Allison W. Blanshine, R.D. 03, Lititz, Pa., and Richard A. Pucher, 57 Melvin Drive, Leola, Pa.

Filed Aug. 17, 1970, Ser. No. 64,432

Int. Cl. A01d *45/02*

U.S. Cl. 56—98 **5 Claims**



The top center crop gathering chains and lugs are lower at the rear than the respective top side crop gathering chains and lugs and the top fender of the center is lower than the top fenders of the sides to cause the cut stalk crops to tilt inwardly. The rear center plate is tilted downwardly to horizontally feed the inwardly tilted crops for a smoother operation of the attachment.

3,670,483

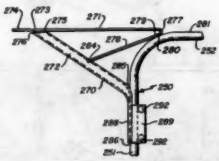
TALL CROP DIVIDER

Guy O. Tufts, Phoenix, Ariz.; Thomas J. Scarnato, Barrington, and Peter J. Peacock, Western Springs, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 5, 1970, Ser. No. 9,019

Int. Cl. A01d *63/00*

U.S. Cl. 56—314 **9 Claims**



A divider for attachment to the transverse member of a pushover bar assembly of a forage harvesting machine. The divider is a triangular structure having one leg alignable with the cropward side of the machine and a diagonal leg which is angled toward the center of the harvester. The legs are interconnected at their forward ends and form a divider point. The divider is pivotally mounted on the crossbar and is adjustable about a horizontal axis to optimum position. The one leg is resilient and is flexed against the pushover bar assembly to hold the parts tight. The structure of the one leg and rimforcing brace prevents hairpinning of the crops.

3,670,484

MECHANISM FOR WITHDRAWING AND WINDING YARN IN SPINNING UNITS

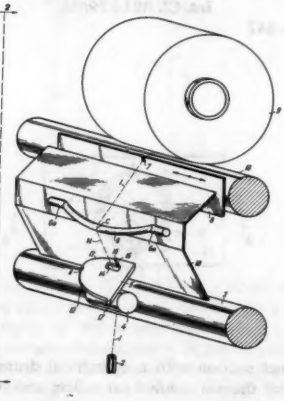
Ladislav Brazda, deceased, late of Cerveny Kostelec (by Drahuska Brazdova, Dagmar Brazdova, Heirs); Miloslav Prochazka, Nachod; Vladimir Kuhn, Velke Svatonovice; Josef Ozdian, Cerveny Kostelec, and Rudolf Benes, Trubejov U Nachoda, all of Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Feb. 26, 1970, Ser. No. 14,531

Claims priority, application Czechoslovakia, March 7, 1969, 1676/69

Int. Cl. D01h *13/04, 15/00*

U.S. Cl. 57—34 R **6 Claims**



Mechanism for withdrawing and winding yarn from spinning units, said mechanism having a novel combination of elements including a self-threading yarn guide. The mechanism includes in that order a pair of rollers for withdrawing yarn from the outlet of the spinning unit, a self-

threading guide, a tension compensator, and a means for winding a bobbin including a yarn traverse and laying mechanism. The configuration and placement of the self-threading guide are such that after breakage or depletion of the yarn, yarn delivery may be resumed with yarn traveling from the outlet of the spinning unit past the self-threading guide to the yarn traverse, without passing between the yarn withdrawing rollers. Continued yarn traverse and take-up by the bobbin automatically threads the yarn through the self-threading guide and introduces it between the yarn withdrawing rollers.

3,670,485

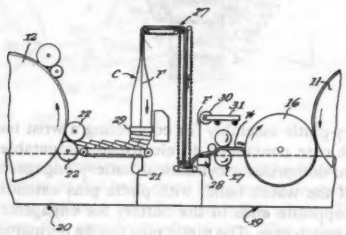
METHOD OF AND APPARATUS FOR FORMING METAL FIBER TEXTILE BLEND AND METAL FIBER TEXTILE PRODUCT

Perry H. Brown, Acton, and Harold H. Webber, Groton, both of Mass., assignors to Brunswick Corporation

Division of Ser. No. 643,983, June 6, 1967. This application Feb. 14, 1969, Ser. No. 799,426

Int. Cl. D01g *1/06, 13/00*

U.S. Cl. 57—50 **15 Claims**



A method of and apparatus for blending conductive metal filament material with nonconductive textile material wherein the textile material is partially carded and the metal filament is delivered to the partially carded material and subsequently carded with said material to break the filament into short metal fibers and blend the metal fibers substantially uniformly with the conductive textile material.

3,670,486

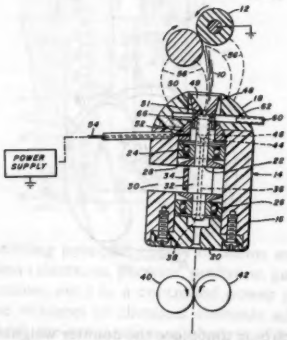
ELECTROSTATIC SPINNING HEAD FUNNEL

George L. Murray, Jr., Milford, Mass., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Dec. 9, 1970, Ser. No. 96,402

Int. Cl. D01h *1/12*

U.S. Cl. 57—58.89 **2 Claims**



An open end electrostatic spinning head apparatus for textile fibers having stationary housing with a throughbore therein; a hollow spindle means rotatably mounted in said housing, the spindle means further comprising a fiber-collecting funnel at the upper end of the spindle means whereby a narrow space bounded by the outer wall of said funnel and said housing throughbore is defined, this funnel having a dielectric shank portion attached to the upper end of the spindle means and electrode means mounted within said housing for electrostatically attracting charged fibers to said collecting funnel. A conductive sleeve means is mounted to and covers the outer surface of the shank portion whereby stray charged fibers entering said space reverse their charge and are repelled from said electrode means upon coming in contact with the conductive sleeve means.

3,670,487

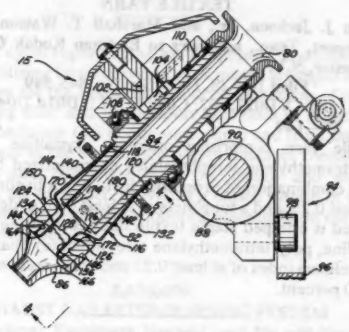
TWISTER DEVICE

Myron Dragisich, Fairview Park, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Sept. 14, 1970, Ser. No. 71,974

Int. Cl. D01h *7/92*

U.S. Cl. 57—77.3 **7 Claims**



An improved twister device for imparting a twist to sliver as it is fed to a balling mechanism includes a pair of resilient fingers which are mounted on a rotatable body and define a nip through which the sliver passes. Rotation of the body and fingers twists the sliver. The spacing at the nip between end portions of the fingers is adjustable to enable sliver of different thicknesses to be frictionally engaged with a force such that the sliver will be twisted when the body is rotated and yet enable the sliver to readily pass through the nip. If the nip becomes obstructed, the spacing between the end portions of the fingers can be increased to enable the obstruction to pass through the nip.

3,670,488

IN-LINE FRICTION TWISTER AND METHOD OF TWISTING

Hans H. Richter, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

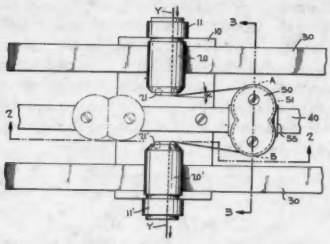
Continuation-in-part of Ser. No. 25,559, April 3, 1970. This application Aug. 28, 1970, Ser. No. 67,896

Int. Cl. D01h *7/92*; D02g *1/04*

U.S. Cl. 57—77.4 **15 Claims**

A method and apparatus is disclosed for imparting false twist to textile yarn wherein a friction twister is employed to impart a plurality of turns of twist to a strand of yarn for each revolution of the friction twister. The invention is particularly suited to situations wherein the yarn strand is moving rapidly. The disclosed frictional twister comprises two axially aligned hollow spindles containing frictional engagement means therein. The two spindles are driven by moving belts that con-

tact the exterior circumferential surfaces of the spindles. Movable yarn guide means are provided to engage the yarn strand and assure adequate frictional engagement between the



yarn strand and the frictional engagement means after the spindles are threaded up. Another embodiment of the friction twister has the capacity to handle a plurality of yarn strands simultaneously.

3,670,489

TEXTILE YARN

Winston J. Jackson, Jr., and Marshall T. Watson, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 28, 1969, Ser. No. 845,549

Int. Cl. D02j *3/02;* **C08g** *17/015;* **D01d** *7/04*

U.S. Cl. 57—140 **23 Claims**

Textile yarn comprising oriented, crystalline fibers of poly(tetramethylene terephthalate) characterized by an improved combination of properties including a liveliness index of at least 0.25, and a toughness of at least 0.50 g./denier. Also disclosed is crimped staple textile fiber comprising oriented, crystalline, poly(tetramethylene terephthalate) characterized by a liveliness index of at least 0.25 and crush recovery greater than 50 percent.

3,670,490

PROCESSING OF FLAX DERIVED YARNS

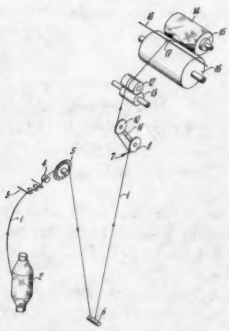
Adrian W. Kneafsey, Ballymena, Northern Ireland, assignor to Ernest Scragg & Sons Limited

Filed May 8, 1970, Ser. No. 35,865

Claims priority, application Great Britain, May 8, 1969, 23,521/69

Int. Cl. D01h *7/92*

U.S. Cl. 57—156 **9 Claims**



A method of processing flax derived yarns having a natural stiffness due to the presence of a resin bonding size in the yarn to make the yarn more suitable for production into a fabric. The yarn is given a false twist by passing it in frictional engagement with a linearly preceding portion of itself to physically work the yarn thereby breaking down the bonding size.

3,670,491

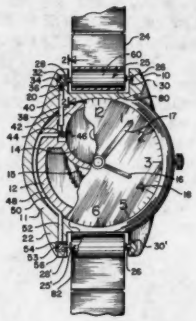
BATTERY-PINTLE ASSEMBLY FOR A WRIST WATCH

Milton E. Weschler, 47-27 Little Neck Parkway, Little Neck, N.Y.

Filed March 10, 1971, Ser. No. 122,732

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 BA **10 Claims**



A battery-pintle assembly for connecting a wrist band to a wrist watch case containing an electrically actuatable timing mechanism, comprises a cylindrical battery engageable with one end of the watch band, with pintle pins extending outwardly of opposite ends of the battery for engagement with lugs of the watch case. The pintle pins can be permanent parts of the battery terminals or can be separate members. The pintle pins can be carried by a casing enclosing the battery or can be carried by a pintle tube removably disposed axially of the battery. The watch case has one or more lugs containing electrical connector means for electrically connecting pintle pins to the timing mechanism. The watch case can support two battery-pintle assemblies at opposite ends, with batteries arranged in a parallel electrical circuit. The wrist band can engage a battery-pintle assembly at either end or at both ends.

3,670,492

BALANCE WHEEL ASSEMBLY

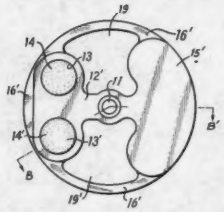
Hirotoki Takamune, and Yoshifumi Mochizuki, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 26, 1970, Ser. No. 40,654

Claims priority, application Japan, May 28, 1969, 44/49372; May 29, 1969, 44/50126

Int. Cl. G04b *17/00;* **G04c** *3/04*

U.S. Cl. 58—28 A **5 Claims**



In an electronic timepiece the counter weights and magnets are secured to a balance wheel which is stamped from stock

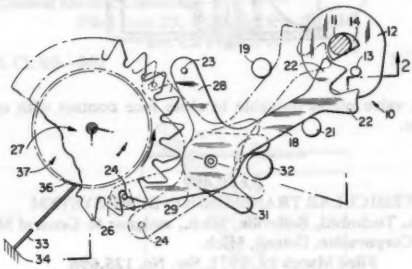
material having a uniform thickness throughout. The weight member for distributing the weight in the desired manner is conformed in part to the configuration of the balance wheel and secured directly thereto by adhesives or the like. The magnetic pieces are secured to the weight member and extend through perforations in the balance wheel per se. The perforations may be beveled or formed with a plurality of circumferential fingers to securely grip the magnetic member extending therethrough.

3,670,493

INDEXING MECHANISM FOR ELECTRIC/ELECTRONIC TIMEPIECES

Paul Wuthrich, Woodbury, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed March 27, 1970, Ser. No. 23,145
Int. Cl. G04b 15/00; G04c 3/04
U.S. Cl. 58—116 **4 Claims**



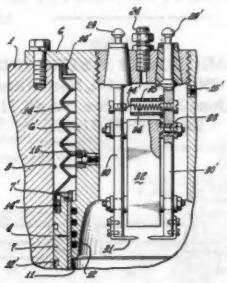
A horological instrument such as a watch includes an indexing mechanism or dial train drive for transmitting power from an oscillating balance wheel to an index wheel. The index wheel drives the gear train of a watch. The balance wheel oscillates a lever between two end positions and one or more pins mounted on the lever step the index wheel in a predetermined direction under the influence of a drag spring. Detenting of the index wheel is accomplished by the drag spring which engages the multi-toothed drag disk mounted on the index wheel.

3,670,494

METHOD AND MEANS OF CONVERTING ATOMIC ENERGY INTO UTILIZABLE KINETIC ENERGY

Josef Papp, San Pedro, Calif., assignor to Environetics, Inc., Gardena, Calif.

Filed Oct. 31, 1968, Ser. No. 772,077
Int. Cl. F01k 27/00; F03g 7/06
U.S. Cl. 60—23 **18 Claims**



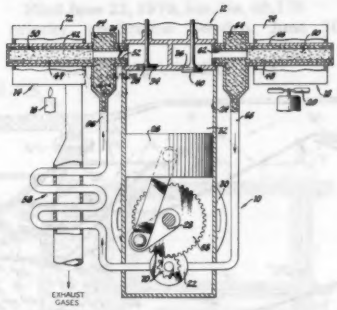
Method of utilizing potential energy of atoms and various forms of radiation (electrons, photons, positrons, gamma beta and alpha radiations, etc.) in a controlled power generating system; effective mixtures of chemical elements adapted for use in the method; the preparation of charges of ingredients for use in virtually gas-tight power generating devices; the activation and control of such charges and devices; structural requirements of power generating devices utilizing the methods and compositions.

3,670,495

CLOSED CYCLE VAPOR ENGINE

Charles B. Leffert, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 15, 1970, Ser. No. 55,037
Int. Cl. F03g 7/06
U.S. Cl. 60—25 **13 Claims**



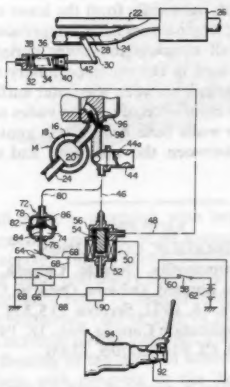
A closed cycle vapor engine has evaporator and condensor elements utilizing liquid carrying wick means arranged to provide surfaces for the evaporation and condensation of the engine working fluid and to transport said fluid in liquid form from the condensor to a condensate pump and from the condensate pump to the evaporator. Vapor passages connect the evaporator and condensor with the intake and exhaust openings of the expander, providing a closed system in which the evaporator and condensor operate essentially on the principle of a heat pipe.

3,670,496

EXHAUST GAS AFTER-BURNING SYSTEM

Yasuo Nakajima; Yoshimasa Hayashi, and Sin-ichi Nagumo, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed July 27, 1970, Ser. No. 58,516
Claims priority, application Japan, July 28, 1969, 44/58980
Int. Cl. F02b 75/10
U.S. Cl. 60—288 **1 Claim**



An exhaust gas after-burning system for reduction vehicular air pollution without sacrificing engine operating efficiency, which system includes a reactor adapted to function at predetermined operating conditions of the engine in response

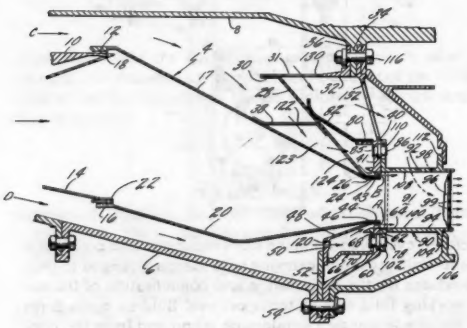
to variations in vehicle speed and intake manifold vacuum of the engine.

3,670,497

COMBUSTION CHAMBER SUPPORT

Donald E. Sheldon, East Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 2, 1970, Ser. No. 68,835
Int. Cl. F02c 7/20, 7/12
U.S. Cl. 60—39.32 **9 Claims**



An annular combustion chamber having an inner and outer wall has its rear, downstream, end mounted to permit radial growth and meter cooling air to control the temperature at that location at engine operating conditions. The rear end of the outer wall is mounted to an outer casing of the engine so that it is fixed axially but permitted radial growth. An annular flange extends inwardly from the outer casing and is positioned so that at engine operating temperatures the rear end of the outer wall contacts the inner periphery of the flange. Slots are located in the inner periphery so that they meter cooling air therethrough to the inner surface of an outer shroud to which the outer ends of turbine vanes are attached. The rear end of the inner wall is mounted to an inner casing of the engine so that it is fixed axially but permitted radial growth. An annular flange extends outwardly from the inner casing and is positioned so that at engine operating temperatures the rear end of the inner wall contacts the outer periphery of the flange. Slots are located in the outer periphery so that they meter cooling air through between the outer surface of inner shrouds at which the inner ends of turbine vanes are attached. The inner and outer walls both have a slip joint connection along their length between the upstream and downstream ends.

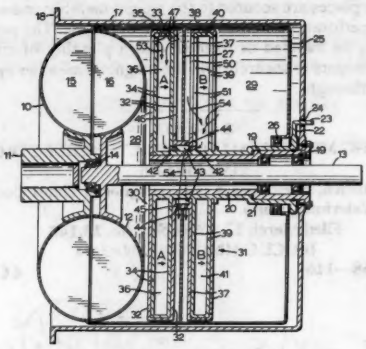
3,670,498

HYDRAULIC COUPLINGS

John E. Becker, Bowmanville, Ontario, Canada, assignor to Eclipse Consultants Limited, Oshawa, Ontario, Canada

Filed Feb. 16, 1971, Ser. No. 115,331
Claims priority, application Canada, Feb. 18, 1970, 075126
Int. Cl. F16d 31/06, 33/00
U.S. Cl. 60—54 **5 Claims**

A hydraulic coupling is provided with a pick-up compartment directly connected with the working compartment and a reservoir compartment. The flow of liquid from the working compartment to the reservoir compartment and the quantities of liquid retained in the respective compartments are controlled by two simultaneously operated valve means in each compartment. Preferably, the valve means comprise pairs of



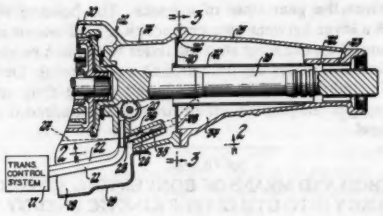
slotted valve plates movable in close face contact with one another.

3,670,499

VEHICULAR TRANSMISSION SUMP SYSTEM

Leon A. Tucholski, Belleville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed March 18, 1971, Ser. No. 125,698
Int. Cl. F16h 41/30
U.S. Cl. 60—54 **5 Claims**



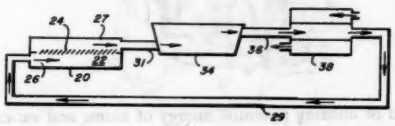
A vehicular transmission has an auxiliary sump provided by the transmission's case extension with a jet pump operated by transmission pressure maintaining a predetermined oil level in the transmission's main sump by delivering the excess oil to the auxiliary sump from which the oil drains to the main sump.

3,670,500

THERMODYNAMIC POWER SYSTEM AND METHODS

Arthur H. Schultz, 6003 Louis Drive, North Olmsted, Ohio

Filed June 22, 1970, Ser. No. 48,313
Int. Cl. F01b 31/00
U.S. Cl. 60—57 R **6 Claims**



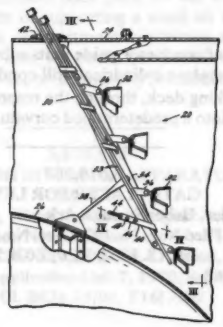
A thermodynamic power system, including in combination a membrane compressor comprising wall means which define an enclosure with a membrane or membranes in the enclosure

dividing the same into inlet and outlet sides. Conduit means connect the inlet side of the membrane compressor to a source of gas. Each membrane is constructed so as to permit the passage of gas molecules from the inlet side to the outlet side and prohibits the passage of gas molecules from the outlet side to the inlet side. Conduit means connect the outlet side of the membrane compressor to a work performing mechanism to drive the same. The disclosure also relates to the method of doing work in accordance with the terms of the invention. Methods of making permeable membranes, in particular membranes having unidirectional characteristics, are included.

3,670,501
GAS TURBINE ENGINE WITH IMPROVED AFTERBURNER

John K. Arand, Palos Verdes Peninsula, Calif., assignor to General Electric Company

Filed June 29, 1970, Ser. No. 50,415
Int. Cl. F02k 3/10
U.S. Cl. 60—261 **3 Claims**

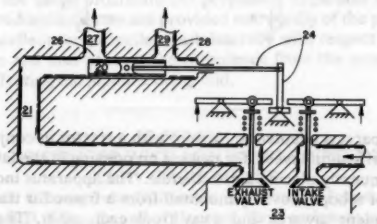


The disclosure shows an afterburner for a gas turbine engine comprising fuel injectors and concentric, annular, V-shaped gutters which function as flameholders. The fuel injectors are mounted in cantilever fashion from a casing and their inner ends are connected by links to a ring to damp vibrations.

3,670,502
ENGINE EXHAUST GAS SEPARATING DEVICES

Joseph C. Firey, 1554 N.E. 95th Street, Seattle, Wash.

Filed March 6, 1970, Ser. No. 17,180
Int. Cl. F02b 75/10; F01n 3/08
U.S. Cl. 60—324 **2 Claims**

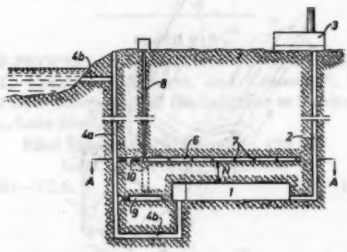


This invention provides means for separating the exhaust gas of an internal combustion engine into two streams, one a higher temperature stream relatively richer in oxides of nitrogen, the other a lower temperature stream relatively richer in unburned fuel components. This separation is made by mechanically actuated valves.

3,670,503
METHOD OF PREVENTING LEAKAGE DURING STORAGE OF A GAS OR A LIQUID IN A ROCK CHAMBER BY ARTIFICALLY SUPPLYING A GAS OR A LIQUID TO THE ROCK SURROUNDING THE ROCK CHAMBER

Ingvar Janelid, Forsetevagen 18, Djursholm, Sweden

Filed June 22, 1970, Ser. No. 48,176
Claims priority, application Sweden, June 30, 1969, 9297/69
Int. Cl. B65g 5/00; E21f 5/14
U.S. Cl. 61—.5 **5 Claims**

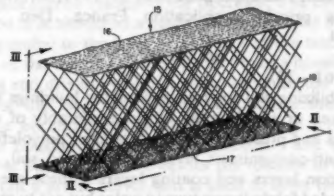


A pressurized gas or liquid in a rock chamber is prevented from leaking out through cracks in the rock if pressurized water is supplied to the rock so as to fill said cracks. The pressurized water shall be supplied to the rock also before and during the blasting of the rock chamber.

3,670,504
FABRIC CONTAINMENT CONSTRUCTIONS

John T. Hayes, Durham, and Robert G. Currier, Roxboro, both of N.C., assignors to Collins and Aikman Corporation, New York, N.Y.

Filed Feb. 5, 1968, Ser. No. 702,925
Int. Cl. E02b 3/04
U.S. Cl. 61—3 **4 Claims**



A dual-wall fabric is provided, with integrally woven drop stitches connecting opposite walls thereof, the fabric being adapted to receive a filler material between walls thereof, the filler material being preferably cast therein, such as concrete, and the fabric walls being of desired materials and weaves to yield desired porosities. One or both of the walls may be constructed of a material having a specific gravity less than water, to facilitate floating of the same in water. Prior to filling the dual-wall fabric with concrete or the like, reinforcing rods may be interspersed between the connecting drop stitches. The dual-wall fabric, or a single-wall fabric may be anchored along beaches, canals and the like, into canopy-like configurations or structures, which structures may be filled with sand or other natural fill, the mound or sand bar thus formed being

then covered by a concrete-like material. In the case of a dual-wall fabric construction, concrete may be pumped between the fabric walls, to provide a concrete-like outer encasement for the sand bar or the like thus formed.

3,670,505

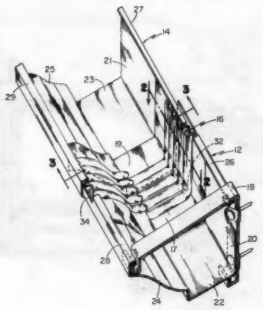
PLASTIC GUTTER EXPANSION JOINT CONSTRUCTION

Leonard Wheelock Weaver, Walpole, Mass., assignor to Bird & Son, Inc., East Walpole, Mass.

Filed Sept. 22, 1970, Ser. No. 74,384

Int. Cl. E02b *9/04;* **E04d** *13/06*

U.S. Cl. 61—14 **4 Claims**



A plastic gutter expansion joint construction comprising a pair of mutually supported telescopic rigid plastic gutter sections having overlapping ends and a flexible plastic expansion bellows extending between said sections therewithin and having opposite end portions bonded to said sections to provide a watertight expansion joint across the telescoping end portions of said sections.

3,670,506

PROCESS FOR STABILIZING SOILS

Yves Gaudard, Lyon, France, assignor to Societe Rhodiaceta, Paris, France

Continuation-in-part of Ser. No. 888,812, Dec. 29, 1969, abandoned. This application May 17, 1971, Ser. No. 144,252

Claims priority, application France, Dec. 31, 1968, 6850894

Int. Cl. E02d *3/00*

U.S. Cl. 61—35 **6 Claims**

In stabilizing soil for foundations for buildings or roads, a non-woven or spunbonded fabric, preferably of continuous filaments and preferably of a polyester or polyolefine, is used as an anti-contaminant layer over cleared soil, below the preparation layers and coating layers if these are used. The spunbonded fabric is pervious to water but not to mud.

3,670,507

MARINE DRILLING STRUCTURE WITH CURVED DRILL CONDUCTOR

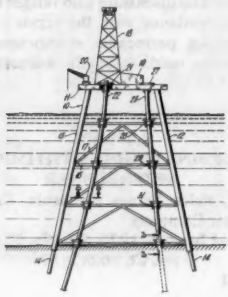
George E. Mott, Metairie, and Johnnie J. Ziober, Morgan City, both of La., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 17, 1970, Ser. No. 72,911

Int. Cl. E02b *17/00;* **E21b** *15/02*

U.S. Cl. 61—46.5 **10 Claims**

The invention relates to a marine structure of the type normally anchored into the substratum of an offshore body of water. The structure includes a work deck which is supported beyond the water's surface to position drilling, processing and other equipment ancillary to a subsea well producing operation. The supporting faction includes a plurality of downwardly reaching support legs that anchor into the substratum by means of piles or other fastening means. The platform is further provided with horizontal bracing, which positions a series of conductor guide units substantially one above the other, whereby a cylindrical drill conductor can be driven from the working deck, through the respective guide units, to be deflected into a predetermined curvature.



3,670,508

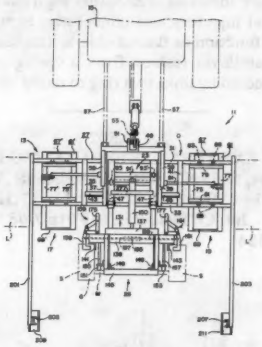
GATE PLACER FOR LEVEE

Louis C. Engler, Heber Springs, Ark.

Filed Nov. 16, 1970, Ser. No. 89,981

Int. Cl. E02b *7/20;* **E02f** *5/16*

U.S. Cl. 61—63 **14 Claims**



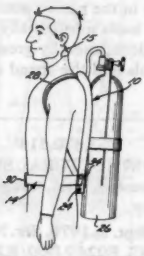
Apparatus adapted to be used with a tractor in conjunction with irrigation levees, for making an opening in the levee and subsequently placing a gate therein. The apparatus includes a pair of scoops movably mounted from a frame for transverse movement towards and away from each other. There is a device provided for urging the scoops downwardly into the dirt. Also, structure is provided for urging the scoops apart to spread the dirt to provide the opening in the levee. A gate handling device is provided for releasably holding a levee gate and for urging the gate into the opening in the levee formed by the scoops.

3,670,509

BUOYANCY ADJUSTMENT BACK PACK

William D. Walters, 2940 Andros Ave., Costa Mesa, Calif.

Filed Aug. 10, 1970, Ser. No. 62,450
Int. Cl. B63c 11/30
U.S. Cl. 61—69 5 Claims



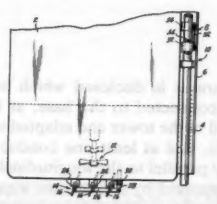
A buoyancy adjustment back pack for use by divers. The back pack is capable of supporting a usual air tank or tanks but also includes a compartment containing a pelleted or fluent mass which can be partly jettisoned to adjust the buoyancy of the diver, or completely jettisoned in an emergency.

3,670,510

PROPELLER WASH DIVERSION APPARATUS FOR PIPE BARGE

Clarence W. Shaw, Metairie, La., assignor to J. Ray McDermott & Co., Inc., New Orleans, La.

Division of Ser. No. 587,288, Oct. 17, 1966, Pat. No. 3,533,244. This application Oct. 7, 1970, Ser. No. 78,882
Int. Cl. B63b 35/04; F16l 1/00
U.S. Cl. 61—72.1 7 Claims



In pipe lay barges where the pipeline enters the water off the rear of the barge proximate the propulsion apparatus for the barge, rudderlike vanes are provided rearwardly of the propellers to deflect the propeller wash laterally with respect to the pipeline and thus prevent the turbulence from the propellers from affecting the pipeline being laid.

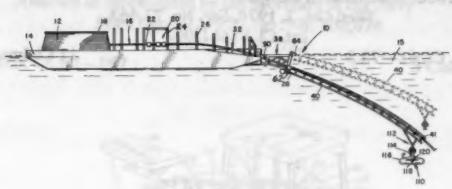
3,670,511

RIGID STINGER WITH ADJUSTABLE PIPELINE CURVATURE MEANS

Robert G. Gibson; John G. Mackin, Jr.; Paul K. Johnson, and Francis D. Koop, Jr., all of Houston, Tex., assignors to Fluor Corporation, Los Angeles, Calif.

Filed April 1, 1970, Ser. No. 24,580
Int. Cl. B63b 35/04; F16l 1/00
U.S. Cl. 61—72.3 7 Claims

A nonarticulated stinger is provided which is towed through a body of water at a predetermined depth. Vertical and lateral position control means maintain the trailing end of a pivotally mounted rigid stinger at predetermined depths below the surface of a body of water. The pipeline guided by the stinger can be made to assume various radii of curvature by adjusting the elevation of pipeline support rollers and/or by adjusting the elevation of the trailing end of the pivotable stinger.

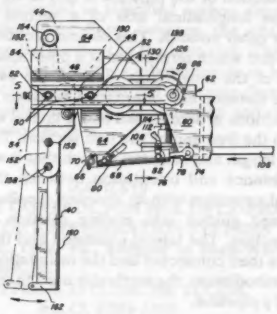


3,670,512

SELF-PROPELLED CABLE BURYING APPARATUS

Robert L. Grazier, Wadsworth, and Kenneth F. Kudingo, Round Lake Beach, both of Ill., assignors to Service Dynamics Inc., Lake Bluff, Ill.

Filed March 12, 1971, Ser. No. 123,663
Int. Cl. E02f 5/02; A01b 3/64
U.S. Cl. 61—72.6 13 Claims



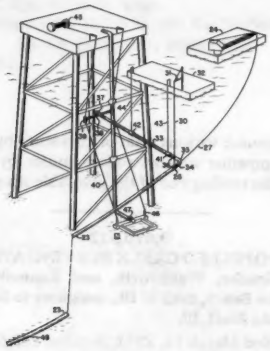
A cable burying apparatus is mounted to a self-propelled tractor which can be ridden by the operator. The cable burying function is achieved by a blade which oscillates in a vertical plane parallel to the front to rear axis of the tractor. The upper end of the blade is pivoted to the top of a housing and a connecting rod driven by an eccentric is connected between the ends of the blade so that rotation of the shaft which mounts the eccentric will oscillate the bottom end of the blade. The housing also carries the eccentric and the shaft which drives the eccentric. Power for the rotation of the shaft is taken from a prime mover that is used to drive the tractor and is coupled to the eccentric shaft by a belt and pulley system including a pulley which is connected to the eccentric shaft. The entire housing is pivotally mounted to the rear of the tractor and can be swung between positions that raise the blade upward away from the ground and that move the blade down into the ground. This can be done by hydraulic means under the control of the operator without leaving his seat and without regard to whether the tractor is moving or not. The blade may have a chute for leading wire or cable through the chute to the bottom of the blade from the top thereof, or it may have a connection at its bottom end to enable a cable or pipe to be connected thereto to be pulled through the ground. In either case there is a narrow slit trench cut by the oscillation of the blade and the cable or pipe is disposed in the bottom of the trench.

3,670,513

METHOD FOR SUBSURFACE FLOWLINE CONNECTION

Jamie F. Matthews, Jr., Houston, Tex., assignor to Esso Production Research Company

Filed Oct. 2, 1970, Ser. No. 77,463
Int. Cl. F16l 1/00
U.S. Cl. 61—72.3 **11 Claims**



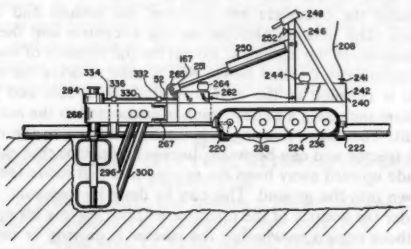
A method for constructing an underwater pipeline installation. One section of the pipeline is laid along a line which intersects the longitudinal axis of a second section of the pipeline or other conduit. This second section of the pipeline has a free end which terminates at a point spaced from the intersection of the longitudinal axes of the two sections. The subsurface distance and orientation between the free ends of the two sections is determined and a lateral extension is then secured to the free end of the first section. The lateral extension has a length and orientation such that it will span the subsurface distance and orientation between the two sections. The lateral extension with its attached pipeline section is then lowered and guided into mating relation with the other pipeline section. The lateral extension and the other pipeline section are then connected and the installation is complete. In another embodiment, the method is used to repair or replace a portion of a pipeline.

3,670,514

AUTOMATIC SUBMARINE TRENCHER

Michael P. Breston, and Ray D. Keilberg, both of Houston, Tex., assignors to Fluor Corporation, Los Angeles, Calif.

Filed Sept. 4, 1970, Ser. No. 69,566
Int. Cl. E02f 5/08, 16/1, 1/00
U.S. Cl. 61—72.4 **21 Claims**



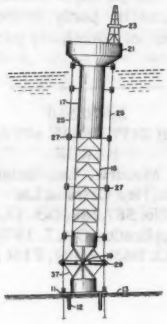
An automatic trencher is provided for entrenching a pipeline in the bed of a body of water. The trencher is adapted to ride over the pipeline and includes one or more trenching tools which cut away the formation of the bed to form a single trench therein for receiving and burying the pipeline. Power and control signals are supplied by a flexible cable coupling the trencher with an accompanying overhead marine vessel. This power is used to move the trenching tools, to advance the trencher along the path of the pipeline as the trench is being formed, and to energize surveillance apparatus. Depending on the type of soil, tools of various configurations can readily be interchanged while the trencher is submerged. Piston-type hydraulic pump-motor combinations rotate the tools and propel the trencher along the desired path. Means responsive to the fluid pressure in the pumps automatically maintain the power output at the tools substantially constant within a wide range of load variations, thereby greatly increasing both the efficiency of the tools and the speed of the trenching operation.

3,670,515

ARTICULATED STRUCTURAL SUPPORT LINKAGE

James R. Lloyd, Houston, Tex., assignor to Esso Production Research Company

Filed Sept. 2, 1970, Ser. No. 69,066
Int. Cl. E02d 21/00; E21b 7/12
U.S. Cl. 61—46.5 **4 Claims**



Offshore apparatus is disclosed which includes a base, a tower pivotally connected to the base, at least one support member attached to the tower and adapted to slidably support a conductor pipe, and at least one conductor pipe adjacent and substantially parallel to the longitudinal axis of the tower and laterally supported by at least one support member. An articulatable means connects the apparatus to a span of the conductor pipe situated in close proximity to the pivotal connection. This means provides sufficient lateral support to the pipe span to prevent buckling and at the same time controls the configuration of the pipe span as the tower sways to prevent bending stress within the pipe span from attaining a level that will cause the pipe to fail.

3,670,516

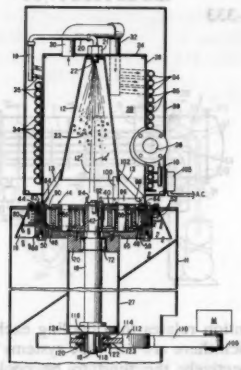
MACHINE FOR MAKING DRY ICE PELLETS

Paul P. Duron, Anaheim, and Harold T. Rich, Fullerton, both of Calif., assignors to Air Reduction Company, Incorporated, New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,552
Int. Cl. B29c 3/00
U.S. Cl. 62—35 **22 Claims**

A dry ice pellet machine having a snow horn for flashing liquid carbon dioxide into snow; an extruding ring die for receiving the snow and consisting of an internal ring gear with radial drawnholes in and between the gear teeth around the ring periphery; a concentrically pivoted carrier within the ring

die having diametrically positioned gear pinions for planetary movement in meshing engagement with the ring gear, and alternatively, rolls on the carrier for traversing a corresponding



surface of the ring die; a drive motor for rotating the carrier and causing collected snow to be entrained and forced by the rolls (meshing gears) into the draw-holes and extruded therefrom as ice pellets.

3,670,517

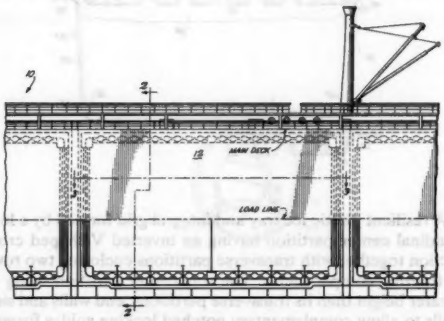
APPARATUS FOR COOLING AND FILLING LIQUEFIED GAS TRANSPORT AND STORAGE TANKS AND IMPROVEMENTS IN SAID TANKS

Ernst A. Nonnecke, Hamburg, Germany, assignor to John J. McMullen, Montclair, N.J.

Continuation of Ser. No. 440,081, March 16, 1965. This application May 15, 1968, Ser. No. 732,009

Int. Cl. F17c 7/00

U.S. Cl. 62—45 **12 Claims**



A transport tank for carrying liquefied gas at about ambient pressure including free-standing inner and outer tank walls formed of material for withstanding low temperatures so that the outer tank acts as a secondary system in the event the inner tank fails and a plurality of interconnecting members coupling the inner tank wall to the outer tank wall so as to limit the relative movement therebetween but provide 2° of freedom within this limit. Stress members secured to the inner and outer tank walls are provided to assure more uniform thermal tank growth in the vertical direction.

3,670,518

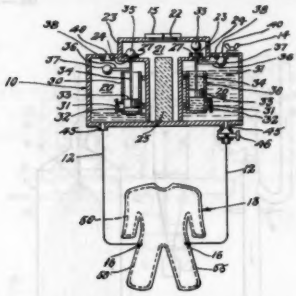
GARMENT COOLING SYSTEM

John J. Esposito, Delran, N.J., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 21, 1970, Ser. No. 100,074

Int. Cl. F25d 3/12

U.S. Cl. 62—167 **3 Claims**



A protective garment for providing cooling including a network of flexible tubing completing a loop between two chambers thermally connected to solidified carbon dioxide. Heat transfer fluid alternately flows between the chambers to transfer heat from the garment to the heat sink. The pressure generated by gasification of the carbon dioxide as heat is absorbed in each chamber causes the alternate flow. A float valve in each chamber controls the admission and exhaustion of the gaseous carbon dioxide.

3,670,519

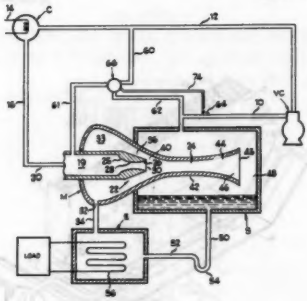
CAPACITY CONTROL FOR MULTIPLE-PHASE EJECTOR REFRIGERATION SYSTEMS

Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 8, 1971, Ser. No. 113,224

Int. Cl. F25b 1/00

U.S. Cl. 62—116 **28 Claims**

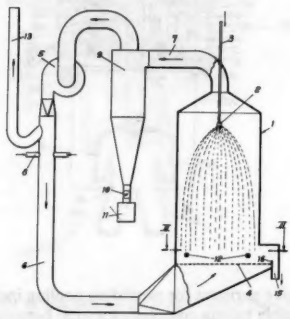


A multiple-phase ejector refrigeration system including a capacity control allowing part-load operation. The capacity is varied by bleeding a stream of hot gas from the discharge side of a vapor compressor and introducing it in a controlled manner into the liquid nozzle of the multiple-phase ejector. This has the effect of first increasing and then reducing the efficiency of the nozzle as the bleed rate increases, thereby affecting the efficiency and flow capacity of the ejector unit.

3,670,520
INSTALLATION FOR FREEZING A LIQUID OR SEMI-LIQUID PRODUCT

Robert C. Bontell, Clichy, France, assignor to Societe D'Etudes Et D'Exploitation De Procedes Pour L'Industrie Alimentaire Sepial, Clichy, France

Filed Feb. 13, 1970, Ser. No. 11,120
Claims priority, application France, April 2, 1969, 6909973
Int. Cl. F28d 5/00
U.S. Cl. 62—314 1 Claim

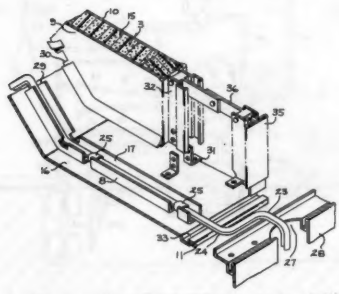


The invention concerns an installation for freezing a liquid or semi-liquid product comprises a vessel in the form of a vertical tower through which a rising current of cold gas may pass to superficially freeze the droplets, an atomizer in the upper portion of the vessel for atomizing the product into droplets, a fluidization plate disposed in the lower portion of the vessel for collecting superficially frozen atomized droplets in a fluidized bed in which the freezing of the superficially frozen droplets is completed.

3,670,521
SIDE-BY-SIDE REFRIGERATOR

Gerald Floyd Dodge, III, Louisville, and Howard D. F. True, Jr., Fern Creek, both of Ky., assignors to General Electric Company

Filed Nov. 17, 1970, Ser. No. 90,376
Int. Cl. F25d 23/00
U.S. Cl. 62—329 3 Claims

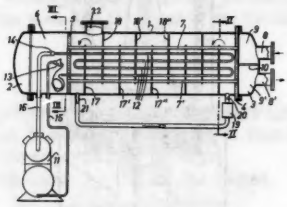


A refrigerator comprising a single liner and a removable partition separating the liner space into side-by-side storage compartments. The refrigerant conduits passing into the liner area for connecting a refrigerant condensing unit to an evaporator unit in the rear portion of one of the compartments are positioned in a passage beneath the partition.

3,670,522
EXCHANGER FOR COOLING FLUIDS

Adam Bresin, 9 Cite du Paradis, 75 Paris 10, France

Filed Aug. 18, 1970, Ser. No. 64,695
Claims priority, application France, Sept. 4, 1969, 6930169
Int. Cl. F25d 17/00
U.S. Cl. 62—333 6 Claims

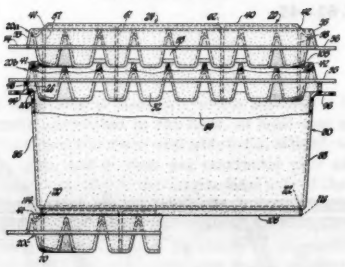


This invention relates to a cooling exchanger for cooling fluids in which there are two pipe systems through which are passed respectively the fluid to be cooled and the cold-producing fluid. The pipes for the cold-producing fluid are distributed among the pipes for carrying the fluid to be cooled and both sets of pipes are submerged in a refrigerating liquid.

3,670,523
FLEXIBLE PLASTIC ICE TRAY AND STORAGE CONTAINER

Thomas H. Fogt, West Carrollton; William R. Steiner, and John M. Murphy, both of Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1970, Ser. No. 88,388
Int. Cl. F25c 5/18
U.S. Cl. 62—344 6 Claims



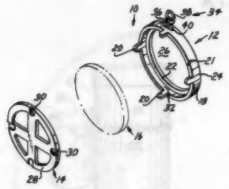
A resilient plastic ice tray and integral grid formed by a longitudinal center partition having an inverted V-shaped cross section together with transverse partitions enclosing two rows of freezing compartments. The tray center partition being of greater height than its transverse partitions, end walls and side walls to allow complementary notched locking guides formed on the underside thereof to cooperate with the upstanding rib portion of the central partition of an underlying tray for relative sliding movement therebetween and to support the trays in interlocked nested fashion when the trays are stacked one upon another in vertically aligned relation. Each tray has its side and end walls provided with an outwardly extending flange wall which allows a tray with its frozen contents to be inverted and nested over a receiving container having a cooperating outwardly directed seating ledge about its upper open end to harvest ice cubes into the container while the container additionally provides for a tray to be nested in an upright position either over or under the container.

3,670,524

ORNAMENTAL DEVICE

Irving Korwin, New Rochelle, N.Y., assignor to Wideband Jewelry Corp., New York, N.Y.

Filed March 30, 1970, Ser. No. 23,885
Int. Cl. A44c *15/00*
U.S. Cl. 63—18 2 Claims



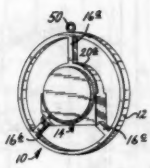
An article of jewelry comprises a setting composed of several parts releasably secured together and an ornamental element held between the parts and exposed at a window in one of the parts. The element may be a disc composed of a precious metal with decorative indicia placed thereon, or it may be an ornament such as a valuable coin. A number of such objects may be interchangeably used with a single setting. A member is attached to one of the parts of the setting and is employed to support the jewelry article in a carrying position when the article is used for personal adornment. Such a member may take the form of a cufflink clasp bar, a tie pin clasp bar, a money clip fastening device, a ring mounting or the like.

3,670,525

MAGNETIC SEX-DENOTING ORNAMENT WHICH ATTRACTS OR REPELLS RESPECTIVE SIMILAR ORNAMENTS DENOTING UNLIKE OR LIKE SEX

William R. Mulligan, 5243 Idaho Ave. N., Crystal, Minn.

Filed Aug. 31, 1970, Ser. No. 68,104
Int. Cl. A44c *25/00*
U.S. Cl. 63—23 3 Claims



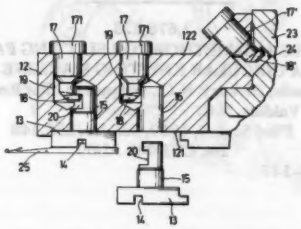
A novelty in the form of a planar circularly-shaped medallion having either a male or female symbol defined by a center portion thereof, the center portion further defining a coaxially extending cylindrically-shaped cavity. Two cylindrically-shaped magnets are positioned within the cylindrically-shaped cavity having like magnetic poles of one polarity outwardly directed for medallions symbolically defining one of the sexes and magnetic poles of the other polarity outwardly directed for medallions symbolically defining the other of the sexes so that the medallions symbolically defining the same sex repel one another and medallions symbolically defining opposite sexes attract one another.

3,670,526

NEEDLE TRACK LOCKING MEANS FOR KNITTING MACHINES

Johann Martinetz, Hechingen/Wuerttemberg, Germany, assignor to Firma Mayer & Cie, Tailfingen/Wuerttemberg, Germany

Filed July 20, 1970, Ser. No. 56,417
Claims priority, application Germany, July 31, 1969, P 19 38 891.1
Int. Cl. D04b *9/06, 15/34*
U.S. Cl. 66—20 5 Claims



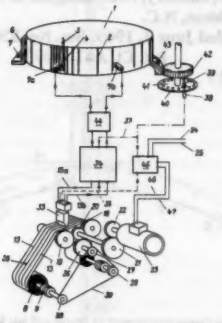
A lock for a knitting machine which permits guiding tracks thereof to be quickly exchanged in groups or as a unit. The tracks are removably secured to ring segments by the lock. The lock includes a first stud disposed normal to the track and received in a first bore in the ring segment extending inwardly from a first face of the ring segment. A second, headed stud, extends into a second bore, extending inwardly from the second, opposite face of the ring segment. The first and second bores partially overlap and communicate at their inner ends. Interfitting cam and notch configurations are provided on the confronting, inner ends of the studs, whereby they are secured together against separation by turning one stud relative to the other.

3,670,527

CIRCULAR KNITTING-MACHINE

Norbert Paul Bourgeois, Troyes, France, assignor to Etudes et Bonneterie SA, Lausanne, Switzerland

Filed July 24, 1970, Ser. No. 57,980
Claims priority, application France, July 31, 1969, 6926319; July 31, 1969, 6926320
Int. Cl. D04b *15/78*
U.S. Cl. 66—50 R 9 Claims



The needles of a knitting machine are selectively actuatable upon passing by electro-magnetic selection members. A tape carrying a program for controlling selection of the needles is driven past a reader which supplies information in the form of electrical signals to a memory. The signals are extracted from

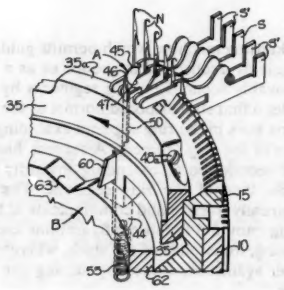
the memory at the frequency of passage of the needles past the selection members, and supplied to the selection members to select the needles. The speed of driving the tape is servo-controlled as a function of the quantity of information in the memory whereby the rate of reading information on the tape need not be synchronized with the frequency of passage of the needles past the selection members. This facilitates use of a two-ended tape alternately wound and unwound from one spool to another. The tape can also carry information for controlling reversal of tape driving means and for selectively reading the principal information according to the direction of motion thereof.

3,670,528

APPARATUS AND METHOD FOR SLITTING FABRIC ON A CIRCULAR KNITTING MACHINE

Oscar Fregeolle, Hickory, N.C., assignor to Pilot Research Corporation, Valdese, N.C.

Filed Sept. 4, 1969, Ser. No. 855,148
Int. Cl. D04b *35/00*
U.S. Cl. 66—147 **10 Claims**



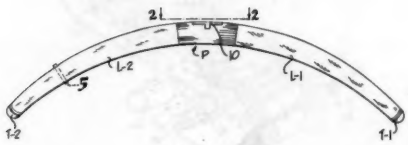
The slitting apparatus includes a vertically movable cutter positioned inside of the needles to engage the fabric as it is drawn from the needles and downwardly through the needle cylinder. Control means is provided for, at times, positioning the cutter in the path of movement of the fabric to slit the fabric in a walewise direction and for, at other times, maintaining the cutter below the level of the fabric so that the fabric is not slit thereby.

3,670,529

SEAMLESS PANTY HOSE AND METHOD

Oscar Fregeolle, Hickory, N.C., assignor to Pilot Research Corporation, Valdese, N.C.

Filed June 3, 1969, Ser. No. 830,045
Int. Cl. A41b *9/02*
U.S. Cl. 66—177 **11 Claims**



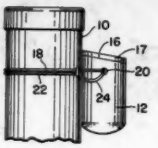
A panty hose type garment is formed by knitting an elongate tubular blank on a circular knitting machine and closing opposite ends of the tubular blank to provide toe closures at opposite ends. During the knitting of the blank, the stitch length of each course is graduated from a large stitch at one side of the blank to a small stitch at the opposite side of the blank so that said one side of the blank is longer than the opposite side and the blank is curved throughout its length. The medial portion of the blank is then slit in a walewise direction along the longer side to form a waist opening and an elastic waistband is attached thereto.

3,670,530

DISPENSER FOR CLOTHES WASHING ADDITIVES

Edmund H. Filipak, 132 Grasmere Ave., Mansfield, Ohio

Filed June 9, 1971, Ser. No. 151,196
Int. Cl. D06f *39/02*
U.S. Cl. 68—17 A **8 Claims**



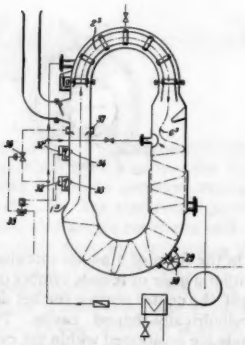
An additive dispenser for clothes washing machines or the like having a container that pivots from a vertical additive-retaining position to a substantially horizontal additive-dispensing position in response to centrifugal force developed by spinning of the agitator. The container is maintained in the retaining and dispensing positions by an elastic band urging the side and top walls, respectively, against the agitator, the elastic band stretching during agitator spin to allow the container to change positions. In another embodiment of the invention, the container is pivotally mounted to the agitator by a bracket that has a leaf spring depending therefrom, the leaf spring being operative to engage the top of the container after agitator spin to hold the same in its dispensing position.

3,670,531

APPARATUS FOR THE WET TREATMENT OF TEXTILES

Alfred F. B. Thies; Bernhard Alfons Ameling, both of Coesfeld; Albert R. Reuther, Frankfurt-Sossenheim, and Werner Fluchter, Lette, all of Germany, assignors to Firma B. Thies, Coesfield, Germany

Filed Nov. 13, 1969, Ser. No. 876,377
Claims priority, application Germany, July 5, 1969, P 19 34 157.2; Sept. 24, 1969, P 19 44 794.0
Int. Cl. B05c *3/134*
U.S. Cl. 68—177 **10 Claims**



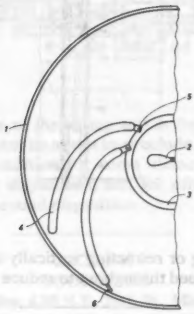
A process of and an apparatus for the wet treatment of textiles in strip or web form which comprises a U-shaped tubular treatment vessel having at least two arms and a semi-circular tubular drive set conveying textiles through the treatment vessel by a treatment liquid and interconnecting the arms.

3,670,532

APPARATUS FOR DYEING SKEINS OF YARN

Hans Nielsen, Reinach, Switzerland, assignor to Vald. Henriksen A/S, Soborg, Denmark

Filed Jan. 14, 1971, Ser. No. 106,363
Claims priority, application Denmark, Jan. 15, 1970, 172/70
Int. Cl. B05c 8/02
U.S. Cl. 68—188 4 Claims



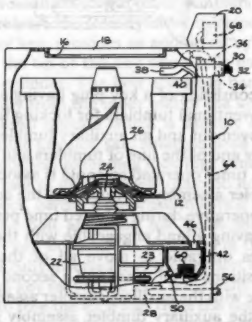
An apparatus for dyeing skeins of yarn in which the skeins are suspended on bars formed as circle involutes.

3,670,533

LIQUID FILL CONTROL

Joseph C. Worst, Louisville, Ky., assignor to General Electric Company

Filed Nov. 16, 1970, Ser. No. 89,830
Int. Cl. D06f 39/08
U.S. Cl. 68—207 3 Claims



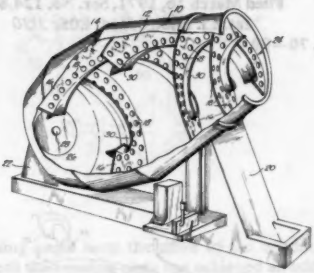
A liquid fill control for an automatic washing machine which shuts off the inflow of water into a washing machine when a preselected water level has been reached. An impervious bellows is mounted within an accumulator in the washing machine, and communicates by means of a pneumatic tube with a pressure switch which controls a water inlet valve. The pressure switch is pre-set by an operator to correspond to a desired water level for the wash load, and influent water into the washing machine deflects the bellows in an amount proportional to the hydrostatic head thereby increasing the pressure upon the pre-set pressure switch through the pneumatic tube until the pressure switch operates to close the water inlet valve.

3,670,534

APPARATUS AND PROCESS FOR TREATING HIDES

Bruce Michael Gould, Waukesha, Wis., assignor to "Automatic" Sprinkler Corporation of America, Cleveland, Ohio

Filed March 20, 1969, Ser. No. 808,838
Int. Cl. C14c 15/00
U.S. Cl. 69—30 3 Claims



The hide-processing apparatus is comprised of a rotatable and axially inclined drum having two helical T-shaped blades fixed to its inside wall. The web of each blade is perforated. In treatment of hide, the drum is partially filled with a processing solution and with hide. Upon rotation of the drum in a tumbling direction, the hide is dehaired by being worked upon by the rotating blade and the removed hair is moved in an opposite direction to the movement of the hide and towards the open end of the drum. Upon rotation of the drum in a discharging direction, the treated hides are discharged through the loading end, yet, because of the perforations, most of the hide-treating liquid is retained in the drum during the discharging phase.

3,670,535

SKI EQUIPMENT LOCK ASSEMBLY

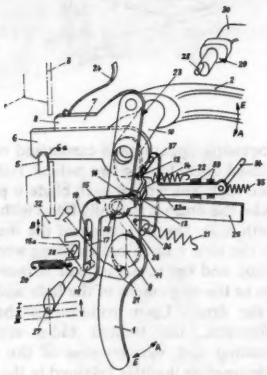
Dennis Stettner, 179 Estates Drive, Piedmont, Calif., and Ronald B. Hollison, 2405 Oakhearst Drive, Oakdale, Calif.

Filed June 1, 1970, Ser. No. 41,793
Int. Cl. E05b 23/00; A47f 7/00; A63c 11/02
U.S. Cl. 70—58 4 Claims

A ski equipment lock assembly affixed to a ski, includes a spring wound cable adapted to be threaded through and wrapped about associated ski equipment and available rail or pole, and its free end then locked and restrained against unauthorized removal. The lock preferably includes a com-

bination mechanism, whereby only those having the combination, may unlock the free end of the cable.

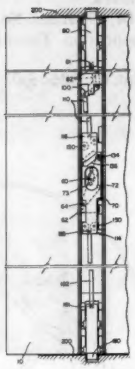
3,670,536
LOCK ARRANGEMENT FOR VEHICLES ESPECIALLY VEHICLES EQUIPPED WITH SLIDING DOORS
Horst Klebba, Weyhausen, Germany, assignor to Volkswagenwerk AKG, Wolfsburg, Germany
Filed March 16, 1971, Ser. No. 124,874
Int. Cl. E05b *65/14*; E05c *3/30*
U.S. Cl. 70—99 **15 Claims**



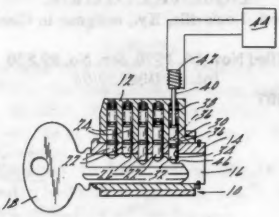
A locking mechanism for the sliding door of a vehicle in which a swingable lock bolt projecting through an opening in the sliding door has associated therewith a safety element slidable along the bolt into said opening to positively prevent release movement of the bolt. Retraction of the safety element from the opening is transmitted by linkages from independently swingable inside and outside door handles, the arrangement being such that the common blocking slide may be selectively positioned to obstruct and prevent the actuation of one or both of said linkages, or of neither of them. Suitable arrangements are made for controlling the position of the blocking slide either from the inside or from the outside of the automobile, the external arrangement comprising a key-controlled cylinder lock. Also there is provided a child proof safety latch operable to prevent opening of the door from within the vehicle, and to permit its opening from the vehicle exterior in the even of an accident. Additional control means also are provided.

3,670,537
LOCK FOR A GLASS DOOR
William J. Horgan, Jr., Allegheny County, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 21,257, March 20, 1970, abandoned. This application Nov. 4, 1970, Ser. No. 86,863
Int. Cl. E05b *63/14*
U.S. Cl. 70—120 **2 Claims**

A lock mechanism for a door comprises one or more lock cylinders which are mounted on opposite sides of the door and which are connected through the door to actuate a common lever in response to appropriate movement of the tabs on the backs of the lock cylinders. The lever locks or unlocks the door by advancing or retracting vertically one or more bolts. Ball bearings are used throughout to reduce friction.



3,670,538
CONTROLLABLE KEY LOCK
Robert E. Curry, 1935 Collegewood Drive, Ypsilanti, Mich.
Filed Nov. 12, 1970, Ser. No. 88,833
Int. Cl. E05b *43/00*, *27/04*
U.S. Cl. 70—271 **8 Claims**

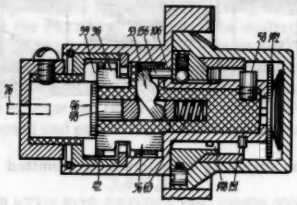


A lock consisting of a key plug having a keyway therein, a line of conventional tumblers for locking the key plug against release movement and an auxiliary tumbler assembly located at the inner end of the line of tumblers and projecting into the keyway. A timer operated solenoid is associated with the auxiliary tumbler assembly for rendering the auxiliary tumbler assembly inoperative during selected time periods. As a result, a first key having a land engageable with the auxiliary tumbler assembly is operable to move all of the tumblers to plug release positions at all times and a second key lacking a land engageable with the auxiliary tumbler assembly is incapable of actuating the auxiliary tumbler assembly so that the second key is useful only during the selected time periods.

3,670,539
COMBINATION LOCK
Kenneth George Charles Marotte, 27 Drummond St., Blackburn, Victoria, Australia
Filed July 28, 1970, Ser. No. 58,966
Claims priority, application Australia, July 28, 1969, 58694/69
Int. Cl. E05b *37/00*
U.S. Cl. 70—299 **16 Claims**

A combination lock having a rotor, mounted in a casing, and which carries locking elements arranged in lengthwise extending slots on the outer surface thereof, the locking ele-

ments each being manipulatable, by suitable mechanism, to cause movement between first and second longitudinally spaced dispositions, each element in one disposition precluding rotation of the rotor by engagement with an abutment on



the internal surface of the casing and in the other disposition clearing the abutment so as not to preclude rotation, the rotation precluding condition for some elements normally corresponding to one disposition, and for others normally corresponding to the second disposition.

3,670,540

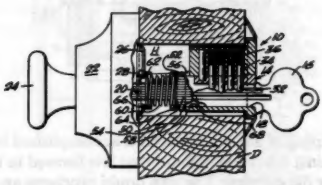
DOOR LOCK

J. de Jesus Fernandez, 430 N.E. 29th St., Miami, Fla.

Filed March 1, 1971, Ser. No. 119,493

Int. Cl. E05b *27/04*

U.S. Cl. 70—421 **8 Claims**



A lock which, in addition to the usual tumblers which are radially moved to release the lock cylinder in response to the insertion of a proper key, provides an additional cylinder lock releasable only by the tip of the key when fully inserted into the key slot of the cylinder. The bolt actuating bar which extends axially inwardly from the inner end of the key slot provides an enlarged head portion which is slidably engaged in the inner portion of the key slot, said enlarged head portion includes a pair of oppositely extending lock lugs which are normally engaged in a pair of diametrically opposed notches provided in the fixed lock barrel. Compression spring means circumposed about the bolt actuating bar holds the enlarged head portion in the key slot and the lock lugs in the notches until a proper key is fully inserted into the key slot whereupon the tip portion of the key moves the lock bar axially inwardly a distance sufficient to free the lock lugs from the notches while permitting a portion of the enlarged head portion to remain in the key slot for rotational movement with the lock cylinder.

3,670,541

BENDING MACHINE

Carl Ullrich Peddinghaus, Obere Lichtenplatz Strasse, 276 Wuppertal-Barmen, Germany

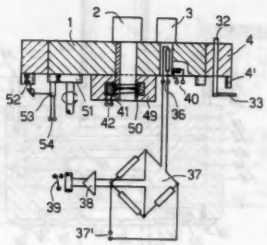
Filed April 20, 1970, Ser. No. 30,205

Claims priority, application Germany, April 22, 1969, P 19 20 265.4

Int. Cl. B21b *37/12*

U.S. Cl. 72—8 **17 Claims**

A bending machine for bars, wires and sections of steel and like materials having a bending plate which supports a pair of bending tools and which is rotatable and drivable in controlled directions, there being also provided a setting member connected to the bending plate for setting various principal bending angles. At least one of the bending tools is provided with switch means which are sensitive to the load applied at the beginning of bending and after reaching the pre-determined



principal bending angle keep the drive to the bending plate switched on until the bending plate has achieved an additional bending angle which corresponds to the angle of rotation of the bending plate from the beginning of switching-on until the response of the switch means.

3,670,542

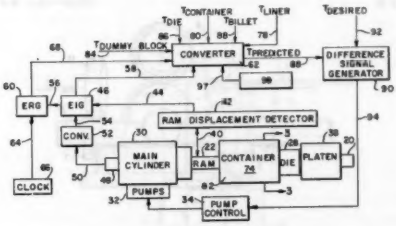
EXTRUSION METHOD AND APPARATUS

Auvo I. Kemppinen, and Bobbie W. Strum, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Dec. 4, 1969, Ser. No. 882,160

Int. Cl. B21b *37/12*; B21c *23/00*

U.S. Cl. 72—8 **17 Claims**



A determination is made of the portions of an extrusion ram's energy that is converted to heat at the segmant of the billet adjacent the die. This is then used to predict the exit temperature of the extruded piece. The predicted exit temperature is compared with a desired exit temperature and the ram speed is adjusted accordingly so that the workpiece is substantially continuously extruded at the desired temperature.

3,670,543

DRAWING AND IRONING PROCESS

Richard Robert Bolt, Lake Villa, and Delbert Edmond Wobbe, Cary, both of Ill., assignors to American Can Company, New York, N.Y.

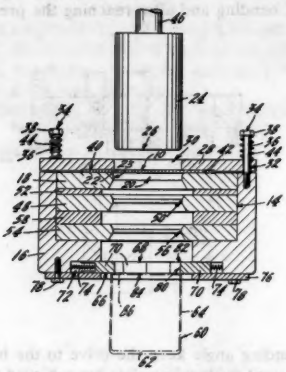
Filed Jan. 27, 1969, Ser. No. 794,141

Int. Cl. B21d *22/28, 37/18*

U.S. Cl. 72—41 **3 Claims**

Prior to the drawing and ironing of a sheet or blank of a material such as untinned low carbon cold rolled steel to form a tubular article such as a can body, the metal sheet is roughened in such manner as to provide an overall, uniformly dense pattern of minute depressions in its surface. Oil or other lubricant is applied to the roughened surface and is retained within these small depressions during the drawing and ironing

operation, whereby to reduce the mechanical and frictional forces on the blank and on the drawing and ironing dies and



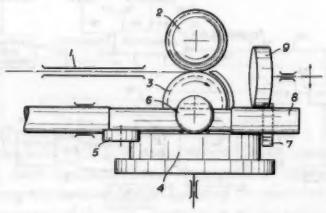
thus eliminate galling of the dies and minimize fracture of the metal.

3,670,544

MACHINE FOR THE PRODUCTION OF TUBING

Friedrich Bohm, Vienna II, Austria, assignor to Metallschlauchfabrik Joseph Ulbrich & Co., Vienna, Austria

Filed Oct. 23, 1970, Ser. No. 82,935
Int. Cl. B21c *37/12*
U.S. Cl. 72—49 **5 Claims**



A machine for producing protective flexible tubing from a profiled, helically wound strip, which comprises a strip guide and a pair of driven profiling rollers disposed after the strip guide, and for pre-profiling the strip. A driven plane profile plate finish-profiling said strip together with one of the profiling rollers, the rollers and the plate constituting profiling means. A freely rotating winding mandrel, the profiled strip being fed to the winding mandrel after being deflected by the plane profile plate, and a driven winding roller co-operates with the winding mandrel, to constitute winding means.

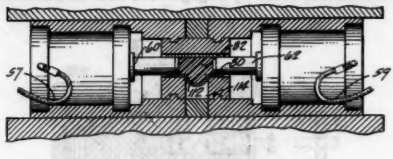
3,670,545

BULGE-FORMING APPARATUS

Ronald E. Kent, Gardena, and Alvin C. Rothenberger, Rolling Hills, both of Calif., assignors to McDonnell Douglas Corporation

Filed Oct. 29, 1970, Ser. No. 85,103
Int. Cl. B21d *9/05*
U.S. Cl. 72—58 **3 Claims**

Power cylinders at each end of a tubular workpiece having a force transmitting medium therein operable by the cylinders to force the workpiece into mold cavities. The force transmitting medium is an incompressible plastic such as a polyurethane plug with a memory which returns to its original configuration when the pressure is removed. The retention force



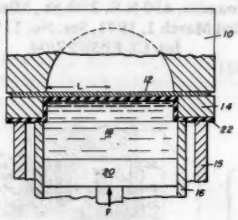
between the opposing cylinders is transmitted through the mold die.

3,670,546

FLUID PRESS

Jose Luis De La Sierra, Norte 45, No. 985, Col. Industrial Vallejo, Mexico

Filed Dec. 5, 1969, Ser. No. 882,615
Claims priority, application Mexico, Dec. 5, 1968, 107591
Int. Cl. B21d *22/12*
U.S. Cl. 72—63 **1 Claim**



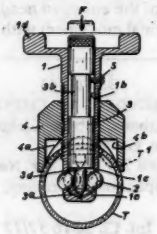
The stamping of a sheet material is accomplished by forcing a liquid against it in such manner that it is formed to the shape of a mold or die element. Use of a liquid produces an even distribution of force against the sheet material and thus reduces breakage while overcoming the need for repetitive stamping in order to obtain complex shapes.

3,670,547

APPARATUS ADAPTED TO FORM COLLARS AROUND OPENINGS PREVIOUSLY EXECUTED IN PLATES OR TUBES

Maurice Granger, 9, rue Bourgneuf, Saint-Etienne, Loire, France

Filed June 24, 1969, Ser. No. 835,972
Claims priority, application France, June 28, 1968, 68137; Aug. 13, 1968, 68178; June 2, 1969, 6917652
Int. Cl. B21d *19/00*
U.S. Cl. 72—75 **26 Claims**



An apparatus adapted to form a collar round an opening in the wall of a tube or in a metal sheet or to expand the end of a

tube. A screw engages a nut provided with a recess to allow the setting of the nut over the open section in which the collar is to be raised. The screw is positioned so as to engage the opening and to carry on the inside of the part to be formed balls or like members so that the outward drawing of the screw urges balls against the edge of the opening so as to engage them against the nut and to form thus the desired collar. The introduction of the balls inside the part to be formed is allowed by a piston sliding inside the screw which controls their outward projection. The piston may be replaced by a cage slidably carried over the outer surface of the screw for defining the collapsed and projecting locations of the balls.

3,670,548

APPARATUS FOR PRODUCING OPEN-TOPPED HOLLOW ARTICLES

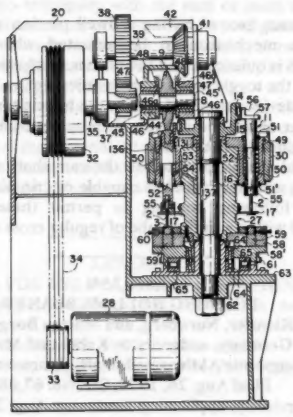
Kazuhiro Mori, Hirakata; Akio Nakamura, Kyoto; Miyoji Nakai, Neyagawa, and Tetuji Kamisako, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 17, 1970, Ser. No. 99,072

Claims priority, application Japan, Dec. 22, 1969, 44/104639

Int. Cl. B21b *1/04;* **B21d** *45/00*

U.S. Cl. 72—187 **7 Claims**



An impact extruder comprising means for feeding circular work-pieces of a metal, a turn table having a plurality of dies and ramming mechanisms supporting vertically movable punches in axial alignment with the dies, respectively, a ramming roll for downwardly driving the ramming mechanisms to cause the phnches to cooperate with associated dies to form the work-pieces into open-topped hollow articles during rotation of the turn table, a cam member for lifting the ramming mechanisms after their forming operations, and strippers for removing the formed articles from the punches.

3,670,549

METHOD AND APPARATUS FOR COLD ROLLING THIN WALL PIPE

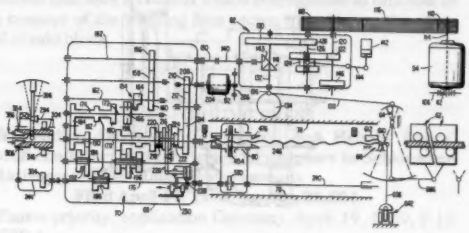
Alexandr Ivanovich Tselikov; Vsevolod Vladimirovich Nosal, and Vadim Anatolievich Verderevsky, all of Moskwa, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky and Proektnokonstruktorsky Institute Metallurgicheskogo Mashinostroenlya, Moscow, U.S.S.R.

Filed Jan. 5, 1970, Ser. No. 529

Int. Cl. B21b *21/04*

U.S. Cl. 72—208 **31 Claims**

A pipe (or tube) mill which receives preformed pipe blanks over an axially fixed mandrel rod and by cold rolling deforms the blanks into super thin walled pipes. The mill has variable speed main and auxiliary drive motors, a main frame, a rolling stand with spring balanced tool rollers with contoured roller tracks having provision for adjustment to accommodate various different diameters of pipe, a rocking lever mechanism for roller stand operation, a mandrel rod clamping mechanism, a



floating blank feeding and rotating chuck with associated variable feed and turning gear mechanism, an intermediate blank clamp, a speed reduction gearing with output to the feed and turning mechanism and, via a crank mechanism, to the rolling stand rocking lever mechanism and correlating controls between mandrel clamp and intermediate blank clamp. Emulsion and lubrication is provided.

3,670,550

WORK ROLL EXCHANGE DEVICE

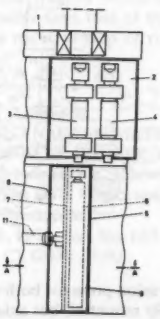
Friedrich Rotter, Kreuztal, Kredenbach, and Horst Hanke, Hilchenbach-Dahlbruch, both of Germany, assignors to Siegener Maschinenbau G.m.b.H.

Filed March 18, 1970, Ser. No. 20,683

Claims priority, application Germany, March 22, 1969, P 19 14 685.1

Int. Cl. B21b *31/08*

U.S. Cl. 72—239 **4 Claims**



The disclosure deals with a device for the installation and removal of the work rolls of a rolling mill roll frame consisting of a carriage which is movable in front of the roll frame. The carriage has a plate for receiving the work rolls which is located on the level of the mill floor. The device also consists of a shifting mechanism for the work rolls which, by means of a driving device, may be raised from its inoperative position below the floor of the mill, which is covered by a plate, to an operative position above the floor.

3,670,551

HOLDING SHELF APPARATUS

Albert Theodore Briggs, Tarentum, and Eugene Henry Swisher, Verona, both of Pa., assignors to United Engineering and Foundry Company, Pittsburgh, Pa.

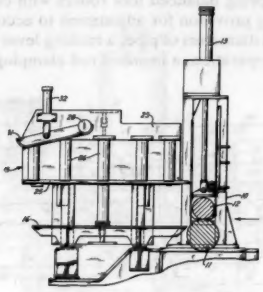
Filed June 15, 1970, Ser. No. 46,360

Int. Cl. B21d *43/16;* **B21b** *39/20*

U.S. Cl. 72—252 **8 Claims**

The present invention relates to an holding shelf apparatus

for strip-like material as is employed, for example, in connection with a tandem rolling mill.



3,670,552

DIE MOUNTING MEANS

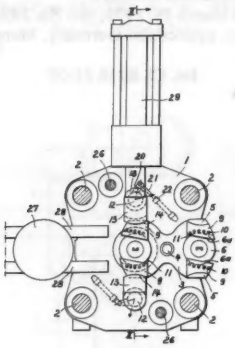
Josef Kaspers, Monchengladbach, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed Feb. 18, 1970, Ser. No. 12,170

Claims priority, application Germany, Feb. 21, 1969, P 19 08 664.7

Int. Cl. B21c *23/00*

U.S. Cl. 72—263 **6 Claims**



In a metal extrusion press for both sections and tubing a die means is rotatably mounted, but axially fixed with respect to the axial direction of the press, on a front platen. Locking means, preferably in the form of two shafts extending in the axial direction of the press, are pivotably mounted but axially fixed on the front platen, and engagement members extend perpendicularly from each locking means, so that pivotal movement causes the engagement members to engage the die mounting means at opposite sides to prevent both axial and rotary movements of the die and to permit access of a saw or shear for cropping an extrusion.

3,670,553

TUBE BENDING MACHINE

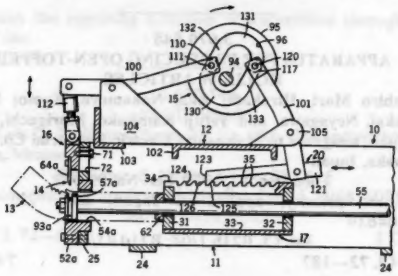
Andrew Nothum, St. Louis; Billy W. Thomas, St. Ann, and Abram L. White, De Soto, all of Mo., assignors to Grover Machine Company, Kirkwood, Mo.

Filed March 2, 1970, Ser. No. 15,732

Int. Cl. B21d *11/04*

U.S. Cl. 72—307 **14 Claims**

This tube bending machine includes a base housing having an end aperture adapted to receive a hollow, rectangular tube. An inner die element is spaced from the margin of the aperture so as to be received by the tube and a toggle mechanism, carrying compatible outer die elements, is mounted to the housing and is adapted to crimp three sides of the tube. A crosshead carriage is mounted within the housing and connected to a pusher mechanism to advance the tube sequentially when the crimping action is completed. The toggle assembly and the pusher mechanism are actuated by a rotating cam connected to each assembly by rocker arms which reciprocate as the cam rotates. The cam is provided with an



eccentric cam groove having a dwell portion which permits the toggle mechanism to be actuated when the pusher mechanism is quiescent and the pusher mechanism to be actuated when the toggle mechanism is quiescent.

A limit device, mounted within the housing, predetermines the number of applied crimps, thereby controling the degree of bend induced into the tube.

A second cam is mounted to the cam shaft and actuates a second die assembly which is capable of crimping the ends of the tube following bending to permit these ends to be telescoped within a similar tube of regular cross section.

3,670,554

FORMING HOLLOW BLANKS

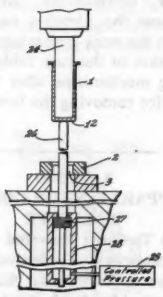
Wolfgang Kienzler, Nurnberg, and Marten Burgdorf, Schwaig, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Aug. 26, 1970, Ser. No. 67,088

Claims priority, application Germany, Aug. 29, 1969, P 19 43 884.7

Int. Cl. B21d *24/10*

U.S. Cl. 72—347 **3 Claims**



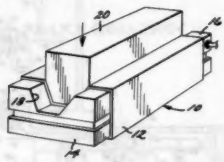
A hollow blank is slipped on a punch to be formed in cooperation with a die. Prior to engagement with the die, the blank is held and retained on the punch in a manner which does not disturb the forming process.

3,670,555

METHOD OF FABRICATING STRUCTURAL MEMBERS

Carl K. Fredericks, San Diego, Calif., assignor to Corlite Corporation, San Diego, Calif.

Filed June 24, 1970, Ser. No. 49,221
Int. Cl. B21d *9/05, 9/08*
U.S. Cl. 72—370 11 Claims



A method of fabricating a structural member by arranging a length of formable material in overlying relation to one or more recesses defined by a mandrel or mandrels. One or more rams are utilized to urge the formable material into such recess to place the formable material under tension. Various configurations of mandrels and rams are utilized to form structural members of various configurations. The method may also include the step of pivoting certain of the mandrels to bring them into contiguity with the ram or rams to thereby form structural members of still different configurations. The mandrels can be removed from the structural member, or made of lightweight material and left in place for insulation, structural stiffening, and the like.

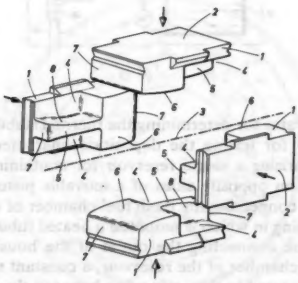
The formable material is preferably in the form of a continuous loop or band arranged about the mandrel or mandrels so that urging of the material into the recess or recesses places the loop under tension, conforming it to the shape of the mandrel and the recess. Many variations of the concept are disclosed.

3,670,556

TOOL FOR USE IN A SWAGING MACHINE

Bruno Kralowetz, Weinleiten 142, St. Ulrich near Steyr, Austria

Filed May 25, 1970, Ser. No. 41,464
Claims priority, application Austria, June 16, 1969, A 5672/69
Int. Cl. B21j *13/02*
U.S. Cl. 72—402 4 Claims



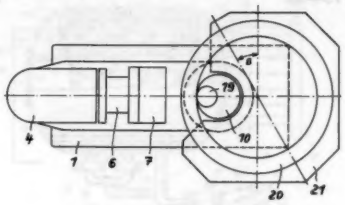
Four hammers are spaced 90° apart about an axis along which a workpiece is movable. The hammers extend radially to the axis and are intended to carry at their free ends respective tools. Each of the tools comprises a block having the general shape of a quadrangular prism which has four longitudinal side faces. The block has a central web, which forms a narrow section of one of the longitudinal side faces and extends from one end of the block approximately over one half of the length thereof. The one longitudinal side face has a working face section which is wider than the narrow section and extends from the latter to the opposite end of the block and slopes symmetrically to the two longitudinal side faces which are adjacent to the one longitudinal side face. The web has two side faces, each of which has in a view on the one longitudinal side face a contour which corresponds to one-half of the contour of the working face secton in a view on the other end of said block.

3,670,557

RING-FORGING PRESS

Willy Muller, Dusseldorf-Gerresheim, and Helmut Robra, Mulheim/Ruhr, both of Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed April 17, 1970, Ser. No. 29,504
Claims priority, application Germany, April 19, 1969, P 19 19 939.4
Int. Cl. B21d *43/02*
U.S. Cl. 72—421 8 Claims



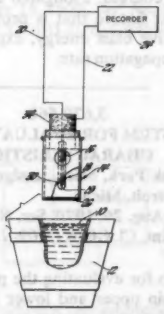
Means for forging pierced and up-set block sections into rings on a forging press, provided with a vertically arranged mandrel and a horizontally acting forging ram, and means for turning and displacing the ring. A secondary mandrel, the diameter of which is smaller than that of the main mandrel, may be included for the manipulation of rings with initially relatively small holes.

3,670,558

RAPID THERMAL ANALYSIS METHOD FOR PREDICTING NODULAR IRON PROPERTIES

Edward F. Ryntz, Jr., Warren; John F. Janowak, Saginaw, and John F. Watton, Roseville, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 28, 1971, Ser. No. 147,836
Int. Cl. G01n *25/02*
U.S. Cl. 73—17 R 4 Claims



A method of rapidly and accurately predicting the cast properties of nodular iron in foundry control operation is disclosed. A sample of nodular iron having a thermal mass such

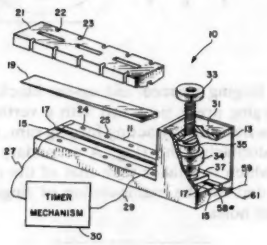
as to cool from 2,300° to 1,850° F in less than 4 minutes is extracted from a heat of molten cast iron immediately before the casting thereof. A cooling curve is generated and divided into characteristic curve segments indicative of the nucleation and growth reactions occurring on solidification. A comparison of the characteristic curve segments with respective families of like curve segments obtained from samples of known metallurgical properties yields one like curve segment from each family most like each characteristic curve segment. Correlation of most like curve segments with a known relationship between said families and nodular iron metallurgical properties yields the largest range of properties possible for the unknown sample on solidification.

3,670,559

LINEAR EXPLOSIVE COMPARISON

Laurence J. Bement, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed June 17, 1971, Ser. No. 154,094
Int. Cl. G01n *33/22*
U.S. Cl. 73—35 **10 Claims**



An apparatus for quantitatively determining the performance of linear explosives, mild detonating fuse and flexible linear shaped charges. Elongated explosive samples are detonated in a test fixture that is provided with means for sensing the explosive blast energy, explosive cutting ability, and detonation propagation rate.

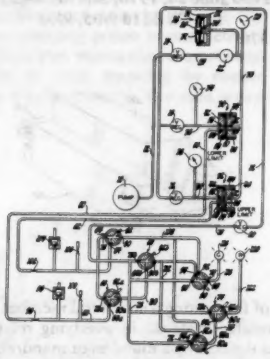
3,670,560

FLUIDIC SYSTEM FOR EVALUATING PHYSICAL CHARACTERISTICS

Fred W. Dega, Oak Park, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1970, Ser. No. 67,161
Int. Cl. G01b *13/02, 13/10*
U.S. Cl. 73—37 **7 Claims**

A fluidic system for evaluating the physical characteristics of an article within upper and lower limits. The system includes a fixture in which the article to be measured is placed, a source of fluid pressure which delivers fluid to the fixture, a plurality of fluidic amplifiers, a pair of interface signal devices and a pair of indicators. Pressure signals resulting from fluid flow past the article in the fixture are conducted to the signal devices which emit control signals to actuate the fluidic amplifiers. The output of two of the fluidic amplifiers are in fluid communication with the indicators and function to selectively



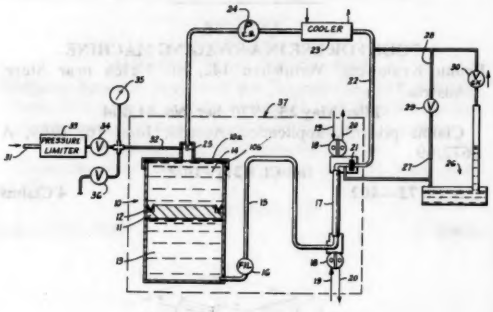
actuate the indicators in response to the fluid pressure in the fixture and the signals emitted by the signal device.

3,670,561

APPARATUS FOR DETERMINING THE THERMAL STABILITY OF FLUIDS

Alf Hundere, P.O. Box 28299, San Antonio, Tex.

Filed Jan. 30, 1970, Ser. No. 7,133
Int. Cl. G01n *33/22*
U.S. Cl. 73—61.2 **8 Claims**



An apparatus for determining the thermal stability of fluids, particularly for testing the deposition characteristics of jet fuels, comprising a single reservoir for containing fresh and tested fuel on opposite sides of a movable piston therein, a supply line connecting the fresh fuel chamber of the reservoir with a housing in which is mounted a heated tubular member, a return line connecting the outlet of the housing with the tested fuel chamber of the reservoir, a constant speed metering pump located in the return line between the housing and the tested fuel chamber of the reservoir to pump the fuel through the apparatus, a filter, designed to trap deposits which remain suspended in the fuel due to heating, located at the outlet of the housing, and a differential pressure measuring device connected across the filter to measure the pressure drop therethrough, and a valved bypass around the filter. The apparatus also contains a source whereby the entire system may be pressurized to a constant pressure, preferably with an inert gas.

3,670,562

HOLDING AND FOLLOW-UP MECHANISM FOR ULTRASONIC FLAW DETECTOR

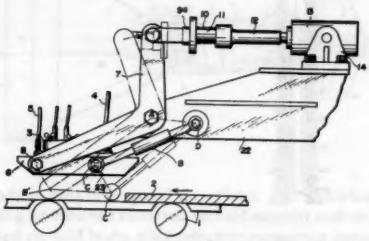
Iwao Muto; Yutaka Matsumura; Katsuyuki Nishifuji, and Kenji Matsuura, all of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Sept. 24, 1970, Ser. No. 75,183

Claims priority, application Japan, Sept. 29, 1969, 44/77085

Int. Cl. G01n *29/04*

U.S. Cl. 73—71.5 9 Claims



An ultrasonic flaw detector element is mounted on a shoe which is connected to a holding arm by a four linked mechanism. The four linked mechanism consists of two pairs of substantially parallel links spaced laterally on the shoe so that the shoe may be moved into a material engaging position and away while its contact surface remains parallel to the surface of the material to be tested. One of the links forms one arm of a bell crank, the other arm of which is connected to the piston of a double acting cylinder so that movement of the piston raises and lowers the shoe.

3,670,563

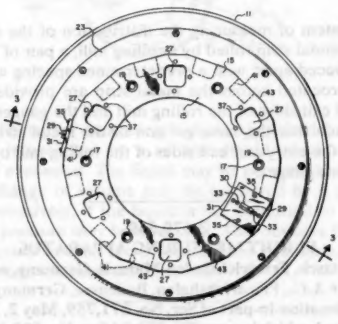
FIXTURE FOR SUPPORTING ARTICLES DURING VIBRATION TESTS

David J. Light, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 5, 1970, Ser. No. 77,786

Int. Cl. G01n *29/00*

U.S. Cl. 73—71.6 8 Claims



A fixture for supporting and securing articles, such as electrical components, during vibration testing of the articles comprising an integral annular unit having a series of spaced blind cavities formed in its top surface and a series of spaced blind cavities formed around its outer surface. Articles to be vibration tested are secured in the cavities of the fixture and the fixture is mounted on the driver head of a vibration exciter whereby the fixture is aligned with the driver coil of the exciter. The cavities may be in the form of partially threaded bores with an intermediate shoulder to receive a disk and a clamping nut for securing test items in the bores.

3,670,564

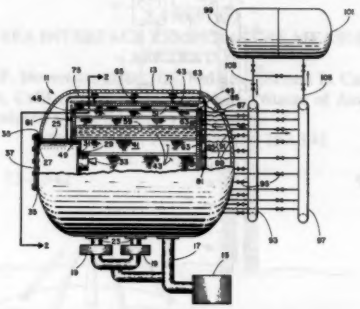
ALTITUDE SIMULATION CHAMBER FOR ROCKET ENGINE TESTING

John W. Davis, and Herschel W. Belew, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed June 21, 1971, Ser. No. 154,935

Int. Cl. G01m *15/00*

U.S. Cl. 73—117.1 10 Claims



A vacuum chamber in which a scale model of the rocket engine base area of a space vehicle is mounted and fired in short duration runs for testing the model under simulated, high-altitude pressure conditions. To dissipate the engine exhaust energy, and particularly the starting shock wave produced when the engine is fired, an energy-absorbing compartment is provided within the vacuum chamber which compartment is made of cryogenically cooled metal honeycomb panels supported by the wall of the vacuum chamber. The cells of the honeycomb panels are opened on the inner side of the panels to present a large, cold and confining surface area to dissipate the energy of the exhaust gas molecules by capturing and freezing the molecules within the honeycomb cells.

3,670,565

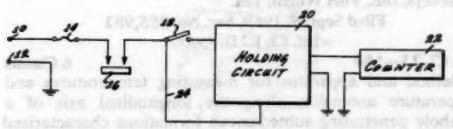
CYCLE COUNTER FOR JET ENGINES

Allen E. Paulson, 3021 Airport Ave., Santa Monica, Calif.

Filed July 15, 1970, Ser. No. 55,172

Int. Cl. G01l *3/26*; G04f *9/00*

U.S. Cl. 73—117.3 9 Claims

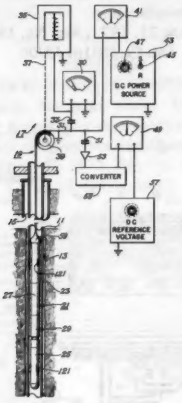


Apparatus for providing a representation of engine life including thermally responsive and throttle responsive switches and an indicator. Provision is made for energizing the indicator when the thermally responsive and throttle responsive switches are closed and subsequently preventing an indication from being registered on the indicator after the throttle responsive switch is opened and reclosed.

3,670,566
APPARATUS FOR ATTACHING A TOOL TO A CONDUIT IN A BOREHOLE

Edward R. Basham, and William D. Smith, both of Fort Worth, Tex., assignors to Go International, Inc., Fort Worth, Tex.

Filed Dec. 10, 1970, Ser. No. 96,864
Int. Cl. E21b *47/00*
U.S. Cl. 73—151 **8 Claims**



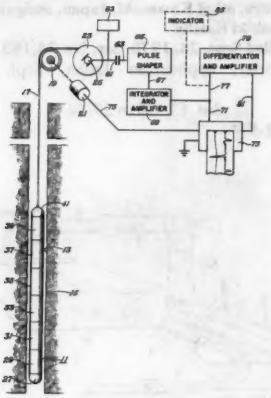
Apparatus for attaching to a conduit at a depth in a borehole, as in free point indicator tools, characterized by a plurality of aspects. In a first aspect, the apparatus has individual, non-flow restricting attachment members that are operable to engage the conduit any number of times on a trip into the well with a force sufficient to bear the weight of the tool and any sinker bars and cable resting thereon. In a second aspect, the force is controlled electrically from the surface with a current limiter and a downhole electric motor is run to stall. In a third aspect, the attachment members are connected with the downhole motor via a shear pin so the pin can be sheared to release the attachment members in the event of power failure. In a fourth aspect, the downhole, or borehole tool has a sensor section with an automatic centralizer for effecting a neutral position of the two movable portions for detecting small rotational or longitudinal movement therebetween. Also disclosed are specific structures and methods that are advantageously employed in measuring the depth at which a conduit such as drill pipe is stuck in the borehole.

3,670,567
MEASURING BOREHOLE TEMPERATURES EMPLOYING DIODE JUNCTION MEANS

Beauford F. Stout, Grandview, Tex., assignor to Worth Well Surveys, Inc., Fort Worth, Tex.

Filed Sept. 8, 1969, Ser. No. 855,982
Int. Cl. E21b *49/00*
U.S. Cl. 73—154 **6 Claims**

Method and apparatus for measuring temperatures and temperature anomalies along the longitudinal axis of a borehole penetrating subterranean formations characterized by employing a constant current flowing through a diode junction means and measuring the variations in voltage across the junction as an indication of the temperature. The diode junction means is linear up to temperatures of about 350° F and linear enough to be usable to temperatures as high as 400° F. Signals are generated that are related by the voltage drop across the diode junction means to the temperature and transmitted to the surface where they are converted to an analog indication of temperature. The analog indication of temperature is differentiated to emphasize temperature anomalies.

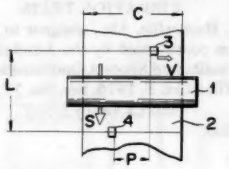


Specific structure of the diode junction means and a temperature compensated constant current regulator is also disclosed.

3,670,568
SYSTEM OF MEASURING THE DISTRIBUTION OF REDUCTION RATE OF METAL STRIPS

Moritada Kubo, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 29, 1970, Ser. No. 102,356
Claims priority, application Japan, Jan. 7, 1970, 45/2114
Int. Cl. B21b *37/02*
U.S. Cl. 73—159 **4 Claims**



In a system of measuring the distribution of the reduction rate of a metal strip rolled by a rolling mill, a pair of thickness gauges spaced apart with a predetermined spacing and which are reciprocated across the metal strip are provided on the entry and exit sides of the rolling mill and the gauges are controlled such that the same portion of the metal strip is measured on the entry and exit sides of the rolling mill by the pair of thickness gauges.

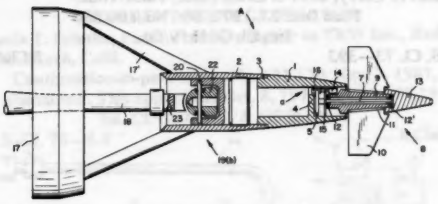
3,670,569
FLIGHT MEASURING APPARATUS

Peter Partzsch, Friedrichshafen-Manzell, Germany, assignor to Dornier A.G., Friedrichshafen, Bodensee, Germany

Continuation-in-part of Ser. No. 871,759, May 2, 1969, abandoned, which is a continuation of Ser. No. 505,150, Oct. 25, 1965, abandoned. This application Jan. 15, 1971, Ser. No. 106,817
Claims priority, application Germany, Nov. 25, 1964, D 45912
Int. Cl. G01c *23/00*
U.S. Cl. 73—180 **8 Claims**

This invention relates to an apparatus for simultaneously measuring the angle of incidence, the angle of sideslip,

distance covered along a flight path and air speed of an aircraft which comprises a body, a rotatable nose portion mounted on the body and having propeller blades thereon, a tail assembly mounted on the body, a support for connection to an associated aircraft, a Cardan joint mounted in the body in the center of gravity of the apparatus and connecting the body to said support, electrical means adjacent to the Cardan joint for measuring angles of rotation between the support and



the body in two orthogonal directions, said electrical means including an element mounted on said support and an element mounted on said body, photoelectric measuring means in the body for measuring the number of revolutions of the nose portion, and means for converting the number of revolutions to determine the flight distance and the air speed from the rotational speed of the nose portion and the pitch of the propeller blades, and to count the revolutions of the nose portion within one unit of time.

3,670,570

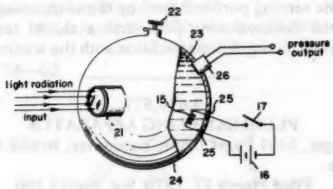
LIGHT INTENSITY CALORIMETER

Robert A. Briones, Granada Hills, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 592,381, Nov. 7, 1966, abandoned. This application April 30, 1971, Ser. No. 139,268

Int. Cl. G01k *17/00*; G01t *1/16*

U.S. Cl. 73—190 R **4 Claims**



A calorimeter for measuring high-energy pulsed laser light. The light is absorbed by a suitable liquid which causes a molecular expansion. The liquid may be permitted to expand and the change of volume may be measured by a capillary tube. Alternatively, if the liquid is not permitted to expand, the rising pressure may be measured. This obviates the usual waiting period needed for a temperature equilibrium to be reached in conventional calorimeters.

3,670,571

JET DEFLECTION VAPOR GAGE

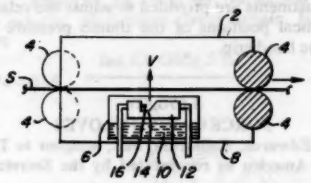
Ralph G. Rudolph, Edgewood Borough, Pa., assignor to United States Steel Corporation

Filed Dec. 5, 1969, Ser. No. 882,540

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 R **5 Claims**

A gage for measuring the flow rate of a vapor in an evacuated chamber has a narrow jet of air directed across an opening through which a stream of the vapor passes. The vapor deflects the air jet in proportion to the amount of material in



the vapor stream. The flow rate is determined by measuring the air pressure on the side of the opening opposite the air jet.

3,670,572

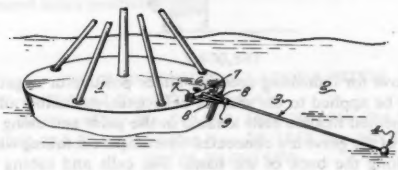
AIR-SEA INTERFACE TEMPERATURE MEASURING APPARATUS

Robert F. Devereux, Oxon Hill, Md., and Ernest L. Casco, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 11, 1971, Ser. No. 152,141

Int. Cl. G01k *1/14*

U.S. Cl. 73—342 **9 Claims**



Vertical distribution of temperature at the sea surface is measured by an array of temperature sensors extending upwardly and downwardly from a small float. The float is carried at the outboard end of a relatively long outrigger member which itself is pivotally carried by a buoy or ship so as to be in a free-swinging disposition capable of floatably riding the undulating sea surface to maintain the sensors at fixed positions relative to the surface both in the air and submerged.

3,670,573

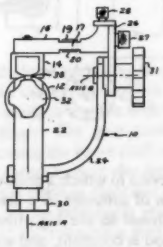
APPARATUS FOR MEASURING THUMB AND FINGER FORCE

Karl Heinrich Eberhard Kroemer, Yellow Springs, Ohio, assignor to The United States of America as represented by the Secretary of the United States Air Force

Filed Nov. 18, 1970, Ser. No. 90,551

Int. Cl. G01l *5/02*

U.S. Cl. 73—379 **4 Claims**



An apparatus for measuring the force exerted by a thumb or finger of a test subject, having a hand grip with a thumb pres-

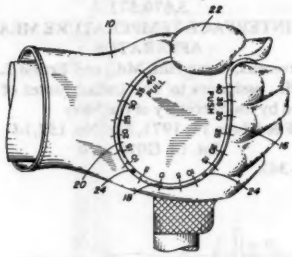
sure well being positioned on a beam adjacent the hand grip. The beam has a reduced section with strain gages thereon, with the output of the strain gages being applied to a recording device. Adjustments are provided to adjust the relative angular and vertical positions of the thumb pressure well with respect to the hand grip.

3,670,574

FORCE GAGING GLOVES

William R. Edwards, California, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 7, 1971, Ser. No. 132,035
Int. Cl. G01l 5/22
U.S. Cl. 73—379 R **6 Claims**



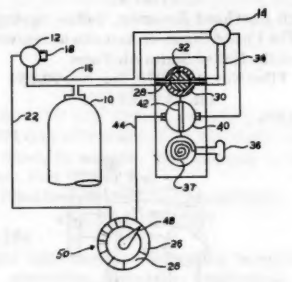
A glove for indicating pressure either positive or negative, as may be applied to the stick of helicopter. A number of interconnected flexible cells located in the palm and along the fingers of the glove are connected by transparent tubing which runs along the back of the hand. The cells and tubing are liquid filled, and a small nylon ball in the tubing moves as pressure is applied to the cells.

3,670,575

INDICATING DEVICE FOR CONTINUOUSLY INDICATING TIME TO DEPLETION OF PRESSURE TANKS IN USE

Bruce D. Emerick, 4927 Hauck Drive, New Orleans, La.

Filed Feb. 19, 1971, Ser. No. 116,780
Int. Cl. G01l 13/00
U.S. Cl. 73—388 **10 Claims**



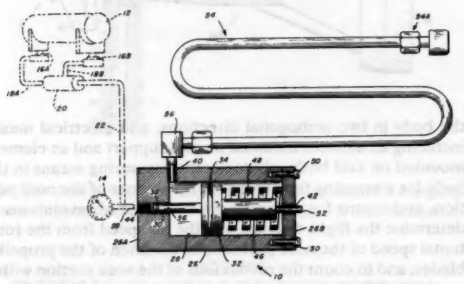
An indicating device in which a pressure transducer periodically measures loss of pressure in a pressure tank to produce an output proportional to the logarithm of the pressure loss rate since the period is constant, and a second pressure transducer continuously measures the effective tank pressure, that is the pressure difference between the tank and the ambient pressures, in mechanical values which are converted into electric logarithmic signals by means of logarithmic potentiometers to drive a dial and pointer respectively in a slide rule application of subtracting exponents, that is logarithms, to divide the effective pressure in the tank by the rate of its use to read the time remaining to depletion from a logarithmic scale numbered arithmatically as indicated on the dial by the pointer.

3,670,576

TEMPERATURE COMPENSATOR FOR A PRESSURE GAUGE

Stuart E. Corry, 4511 S. Lewis Place, Tulsa, Okla.

Filed Dec. 23, 1970, Ser. No. 100,880
Int. Cl. G01l 19/04
U.S. Cl. 73—393 **5 Claims**



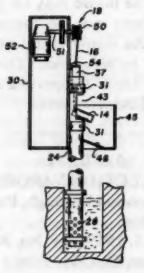
A temperature compensator for a pressure gauge or the like, including a body having a first and second cylindrical cavity coaxial of each other and communicating with each other, a sensing port communicating with one end of the first cylindrical cavity, a vent port communicating with the other end of the first cylindrical cavity, and a compensating port communicating with the second cylindrical cavity, a sense responsive piston positioned in the first cavity intermediate the sensing and vent ports, a compensating piston positioned in the second cavity, the sense responsive and compensating pistons being affixed to each other for simultaneous axial movement, resilient means urging the sense responsive piston towards the sensing port and thereby the compensating piston towards the compensating port, and a closed temperature sensing vessel having communication with the sensing port.

3,670,577

FLUID SAMPLING APPARATUS

Ernst Singer, 3491 Puget Drive, Vancouver, British Columbia, Canada

Filed March 27, 1970, Ser. No. 23,290
Int. Cl. G01n 1/12
U.S. Cl. 73—423 R **4 Claims**



Apparatus for taking samples of fluid, such as industrial waste and sewage effluent, including a sampling cup slidably

mounted in guide means adapted to extend downwardly in the fluid. Hoisting means lowers and raises the cup, and discharge means at the guide causes the cup to tip and discharge its contents when the cup is raised to a predetermined level. The guide means usually is a tube with the cup slidably mounted therein, and the cup is unbalanced but normally retained in an upright position by the tube. When the cup reaches an opening in the tube this unbalanced state causes it to tip over and discharge its contents.

3,670,578

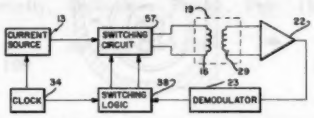
CURRENT PULSE GENERATOR

Louis T. Schulte, Paris, France, assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 681,170, Nov. 7, 1967, abandoned. This application Oct. 8, 1970, Ser. No. 79,239

Int. Cl. G01c *19/28;* **H03k** *17/56*

U.S. Cl. 74—5.6 **8 Claims**



A pulse generator for developing current pulses with precisely controlled rise and fall times. These current pulses are made to pass through a gyro torquer in either one of two directions by means of switches. The gyro torquer current is reversed by digital logic in a pulse rebalanced loop. These current pulses pass through a resistor. The voltage at one end of the resistor is controlled by an operational amplifier. The voltage at the other end of the resistor is controlled so that periodically there is substantially no current flow through either the load or the resistor. This makes it possible to switch the direction of current flow when there is substantially no current flow through the load.

3,670,579

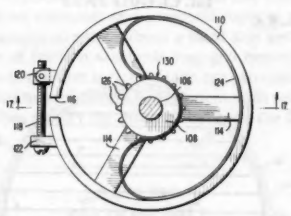
CYCLIC APPARATUS

Donald F. Wilkes, Albuquerque, N. Mex., assignor to Rolamite Incorporated, San Francisco, Calif.

Filed April 29, 1970, Ser. No. 32,808

Int. Cl. F16h *9/00*

U.S. Cl. 74—63 **14 Claims**



The apparatus includes a guide surface and a thin, resiliently flexible endless band. The guide surface provides a continuous cyclic path for the band. The length of each cycle of the guide surface is substantially less than the cyclic length of the band and the band is arched away from the guide surface in a lobe. Portions of the band on opposite sides of the lobe frictionally engage the surface to prevent the lobe from collapsing. The lobe is capable of progressing along the band to displace the lobe relative to the guide surface. Each cycle of the band relative to the guide surface advances the band a predetermined distance along the guide surface.

3,670,580

INDEXING MECHANISMS

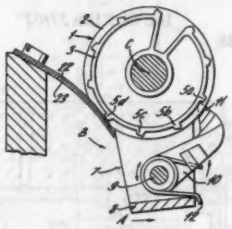
Hans Bud, London, England, assignor to English Numbering Machines Limited, London, England

Filed Oct. 22, 1970, Ser. No. 82,906

Claims priority, application Great Britain, Nov. 7, 1969, 54,570/69

Int. Cl. G05g *5/12*

U.S. Cl. 74—815 **4 Claims**



An indexing mechanism wherein an index wheel having a number of spaced projections around a periphery thereof is indexed by means of an indexing mechanism which is moved to and fro to engage in turn the said projections and wherein there is a leaf spring which acts on the projections to urge same forward to the desired index position or rearwards to the desired index position.

3,670,581

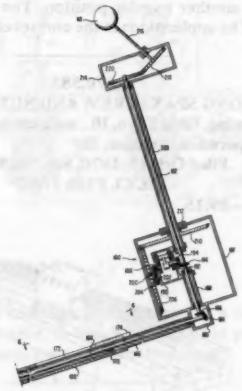
SPACE MOTION SIMULATOR SYSTEM

Eldie H. Holland, Box 747, Athens, Ala.

Division of Ser. No. 544,509, April 22, 1966, Pat. No. 3,521,384. This application Nov. 20, 1969, Ser. No. 877,543

Int. Cl. F16h *35/00*

U.S. Cl. 74—86 **6 Claims**



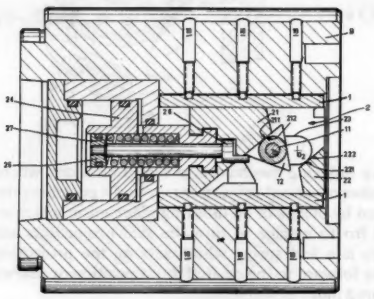
The drive unit includes a vertically disposed drive shaft and a rotatable telescopic driven arm which is mounted for rotation about the drive shaft in a plane which intersects the drive shaft at a suitable angle. The gear train including elliptical gears is disposed between the drive shaft and the driven arm so that the arm will be rotated about the drive shaft at a variable rate. A stationary cam plate is disposed about the drive shaft and a cam follower on the telescopic arm controls the extension and retraction of the telescopic arm as the arm is rotated about the drive shaft. Meshing gears are provided on the stationary cam member and the rotatable driven arm to rotate the arm about its own axis while it is being extended and

retracted by the cam. A driven member may be provided at the end of the driven arm which is also rotatable about its own axis.

3,670,582
POSITIONING DEVICE

Hans Herose, Bern, Switzerland, assignor to Anciens Ets., T.M.B.-J. Tobler S.A., Louvres, France

Filed Nov. 3, 1970, Ser. No. 86,420
Claims priority, application Switzerland, Nov. 26, 1969, 17564/69
Int. Cl. F16h *27/02*
U.S. Cl. 74—88 **6 Claims**

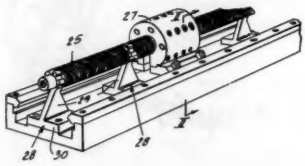


A positioning device comprising a slider acting so as to obtain an alternating rectilinear control movement, means for limiting said movement to a pre-determined travel in one direction or the other while causing said control means to cooperate by members forming an integral part of said slider with positioning means adapted to be put in rotation by said members, said positioning means being coupled directly or indirectly to the positioning element proper, said positioning element being moved in rotation in its plane from one angular position to another angular position. The positioning device finds one of its applications in the control of machine-tools.

3,670,583
LONG SPAN SCREW AND NUT DRIVES

John C. Leming, Glen Ellyn, Ill., assignor to Overton Gear and Tool Corporation, Addison, Ill.

Filed Oct. 19, 1970, Ser. No. 81,996
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **29 Claims**

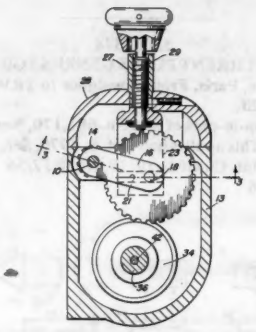


Relatively short coaxial, corotative screw sections are supported by brackets at such intervals as will assure adequate stiffness of the screw against deflection under the loads which it must withstand in service under conditions which a similar screw not supported intermediate its ends could not withstand without deflection. One or more transmission nuts are adapted to run along the screw, or the screw is adapted to run coaxially through the nut or nuts, with free relative passage of the nut and any supporting bracket along the screw. Heavy torque and thrust loads and relatively high speeds can be accommodated. Great practical adaptability and versatility are indicated.

3,670,584
VARIABLE SPEED RATIO TRANSMISSION

Leo C. Bogaerts, and George W. Weinberger, both of Antioch, Ill., assignors to Ammco Tools, Inc., North Chicago, Ill.

Filed Jan. 18, 1971, Ser. No. 107,307
Int. Cl. F16h *15/08, 55/34*
U.S. Cl. 74—199 **8 Claims**

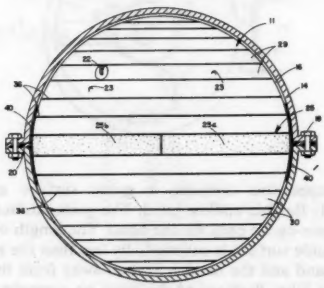


The friction drive wheel of a variable speed ratio transmission for controlling the speed of a lathe crossfeed assembly includes teeth around its periphery that engage the teeth of driving pinion with which they re held in engagement by linkages pivotably connecting the centers of rotation of the driving pinion and the friction drive wheel so that the friction drive wheel remains engaged with the pinion as it is raised nd moved by a control knob to infinitely variable positions between two rotatable friction discs of a clutch. The friction discs are biased toward each other by a compression spring to grip the friction drive wheel at a location on its faces controlled by its position between them, whereby a lead screw that moves the crossfeed assembly and which is connected by a clutch to the friction discs is driven by the discs at an infinitely adjustable speed.

3,670,585
ATTITUDE READOUT FOR FLOATED INERTIAL PLATFORM

Newton C. Alexander, Harbor City; Herbert Stark, Torrance, and Richard C. Thornton, Lawndale, all of Calif., assignors to Northrop Corporation, Beverly Hills, Calif.

Filed April 17, 1970, Ser. No. 29,464
Int. Cl. G01c *19/28*
U.S. Cl. 74—5.6 **18 Claims**



A floated inertial platform comprising a ball member floated within an outer sphere utilizes a plurality of conductive concentric "latitude" rings running around the circumference of the ball member and a resistive ring running around the

equator of the ball member as pick-off excitation elements. The excitation elements are excited in sequence with signals suitable for obtaining readouts about three mutually orthogonal axes such as roll, pitch, and yaw. Pick-offs which may be in the form of pairs of oppositely located pads and strip members in the form of a segmented "longitude" ring are mounted on the outer sphere adjacent to the ball surface. Readout signals are sequentially obtained from the pick-offs which are in Eulerian coordinates and require no compensation for two axes, the third axis readout being readily compensated for cross coupling effects to provide an accurate output in Eulerian coordinates as well.

3,670,586

SPEED VARIATOR WITH FRICTION ELEMENTS

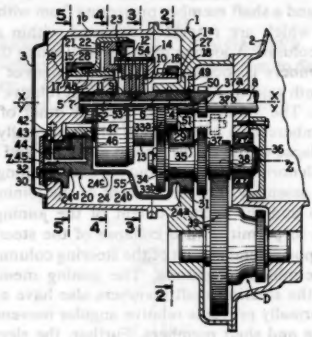
Bernard Falay, Paris, and Armand Froumajou, Pontoise, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Billancourt, France

Filed Nov. 13, 1970, Ser. No. 89,399

Claims priority, application France, Feb. 19, 1970, 7005916

Int. Cl. F16h *15/08*

U.S. Cl. 74—199 **8 Claims**



Speed variator comprising a rocker element mounted to swing about a first axis in a housing. The housing contains a first support rotatable about a second axis and carrying a first series of friction elements and a second support mounted in the rocker element to rotate about a third axis and carrying a second series of friction elements engaged between the friction elements of the first series. Means are provided to modify the angular position of the rocker element with respect to the housing and thus modify the distance between the first, second and third axis.

3,670,587

VERTICAL MILL

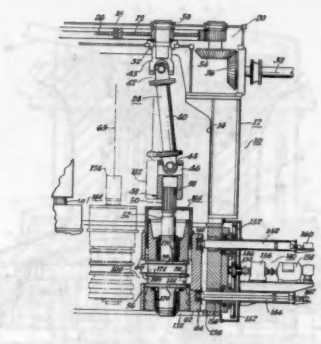
Herbert Lemper, Pittsburgh, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed June 1, 1970, Ser. No. 42,077

Int. Cl. B21b *31/08*

U.S. Cl. 72—239 **18 Claims**

I disclose a rolling mill comprising a housing, a pair of mill rolls rotatably mounted on said housing, means mounted on said housing for rotatably mounting each of said rolls, means for rotating each of said rolls including a drive spindle, means for moving each of said rolls axially, a detachable coupling for detachably coupling each of said spindles to the associated one of said rolls, each of said detachable couplings including inter-fitting and axially withdrawable keying components on the associated drive spindle and mill roll respectively, and said axial moving means being capable of moving each of said rolls through a distance at least sufficient to engage and to withdraw said inter-fitting keying members.



3,670,588

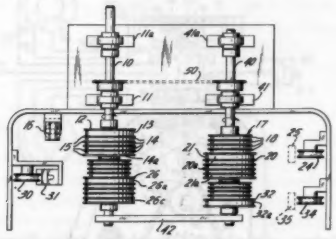
WIRE DRAWING

Carl O. Bruestle, 10 Longview Rd., Edison, N.J.

Filed April 5, 1971, Ser. No. 130,949

Int. Cl. B21c *1/02*

U.S. Cl. 72—289 **16 Claims**



Similar dual step capstan units each having a larger and a smaller diameter section, in which the strand in process provides the driving means from capstan to capstan.

3,670,589

WINCH

John Henry Carter, Lincoln, Mass., assignor to Aeromarine Corporation, Weston, Mass.

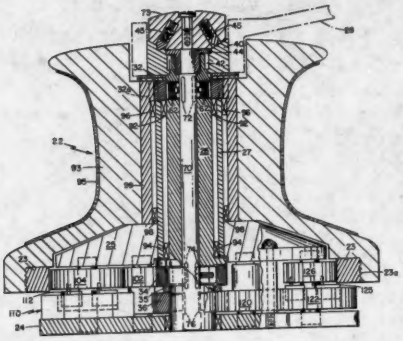
Division of Ser. No. 799,802, Feb. 17, 1969, Pat. No. 3,599,937. This application May 5, 1971, Ser. No. 140,332

Int. Cl. F16h *3/08;* **F16d** *67/00;* **B66d** *1/30*

U.S. Cl. 74—325 **3 Claims**

A multiple-speed winch having a plurality of independently rotatable pinions coaxial with a drive shaft, drive linkages of varying mechanical advantage connecting these pinions to the winch drum and a shaft engager for engaging a selected pinion to the drive shaft. The shaft engager includes drive cams associated with the pinions and mounted for movement between

an extended position which prevents relative rotation of pinion and shaft and a retracted position which permits rotation; selective extension of the drive cams causes the shaft to drive selected pinions.



3,670,590

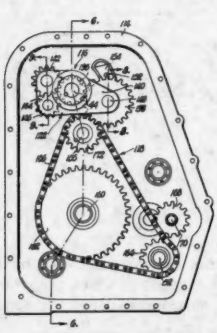
TRANSMISSION FOR FORAGE HARVESTERS AND THE LIKE

William D. Long, Hesston; Ferol S. Fell, Newton; Bernard L. Wells, Wichita, and John P. Prichard, Bentley, all of Kans., assignors to Hesston Corporation, Hesston and Field Queen Incorporated, Maize, Kans., part interest to each

Filed Jan. 18, 1971, Ser. No. 107,090

Int. Cl. F16h *3/34*; A01d *45/18*

U.S. Cl. 74—353 **6 Claims**



A transmission on a forage harvester permits the gathering chains, sickle, and feed rolls thereof to be selectively shifted into forward, neutral, or reverse drive conditions without affecting the operation of the power source, chopper, and blower of the harvester. Components of the transmission are operably coupled in such a manner that the rotative speeds of the feed rolls may be varied relative to the chopper without correspondingly varying the speeds of operation of the sickle and gathering chains, and rockable shifter mechanism journaling the input shaft of the transmission is geometrically arranged such that the transmission tends to remain in its forward drive condition.

3,670,591

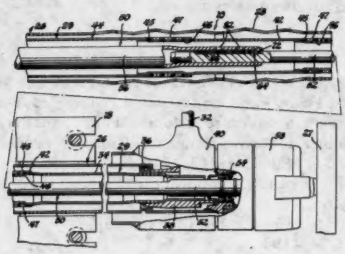
COLLAPSIBLE STEERING SHAFT ASSEMBLY

Thomas J. Milton, Bay City, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 5, 1971, Ser. No. 112,910

Int. Cl. B62d *1/18*

U.S. Cl. 74—492 **4 Claims**



A collapsible steering shaft assembly for a collapsible steering column assembly is disclosed as comprising a sleeve member and a shaft member projecting from within the sleeve member which are rotatably mounted within a collapsible steering column. A joining member for joining the sleeve and shaft members is located intermediate thereof and is fixed against both axial and angular movement relative to one of the members. The joining member and the other of the steering shaft members have a first detent which normally prevents inward collapse of the steering shaft assembly and a second detent which normally prevents outward telescoping of the steering shaft assembly. The first detent of the joining member is shearable and the second detent of the joining member is yieldable to permit inward collapse of the steering shaft assembly upon an end impact of the steering column assembly of a predetermined magnitude. The joining member and the other of the steering shaft members also have a third detent which normally prevents relative angular movement between the sleeve and shaft members. Further, the sleeve and shaft members have structures providing a joint therebetween thatoperates during and after the inward collapse of the steering shaft assembly to maintain the locked angular relationship therebetween. that operates

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3,670,592

STEERING INSTALLATION, ESPECIALLY FOR COMMERCIAL-TYPE VEHICLES

Herbert Senft, Gaggenau (Murgtal), and Hans Rinnergschwentner, Rotenfels (Murgtal), both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Aug. 7, 1970, Ser. No. 62,040

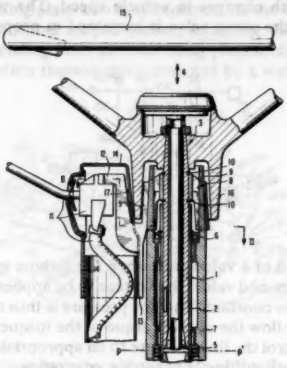
Claims priority, application Germany, Aug. 8, 1969, P 19 40 493.4

Int. Cl. B62d *1/18*

U.S. Cl. 74—493 **10 Claims**

A steering installation for motor vehicles, particularly trucks, which essentially includes a steering spindle, a steering column, a vertically adjustable steering wheel, and vehicle operating and actuating devices, such as gear shift levers etc., coordinated to the steering wheel. The operating and actuating devices are so connected with the steering spindle that they have substantially the same distance to the steering wheel in every position of the latter. A connecting support provided for the operating and actuating devices is secured at the steering spindle so that these devices may move axially with the steering spindle but are prevented from rotating with the steering spindle during normal turning operations. The steering column is fixed in position and surrounds the steering spin-

dle. The connecting support extends through a groove in said column, which groove holds the connecting support against



rotation with the steering spindle. The steering column may also be pivotal for further adjustment possibilities.

3,670,593

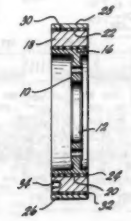
SERIES TYPE VIBRATION DAMPER

William J. Troyer, Coldwater, Mich., assignor to Simpson Industries Inc., Litchfield, Mich.

Filed July 13, 1970, Ser. No. 54,402

Int. Cl. F16f *15/12*

U.S. Cl. 74—574 **3 Claims**



A vibration damper for rotating members consisting of a hub member and at least two annular inertia members mounted upon the hub member by elastic elements. The hub and inertia members include cylindrical surfaces concentric to the axis of hub member rotation and the elastic elements cooperate with these surfaces for mounting one inertia member upon the hub member in a vibration absorbing relationship, and the second inertia member is mounted upon a cylindrical surface defined on the previously mentioned inertia member by an elastic element creating a "series" relationship between the inertia members and the hub member.

3,670,594

INFINITELY VARIABLE PLANETARY TRANSMISSION

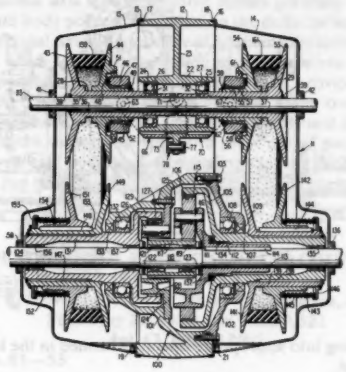
Daniel W. Roper, Rochester, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1970, Ser. No. 5,846

Int. Cl. F16h *37/00, 9/18*

U.S. Cl. 74—689 **7 Claims**

An infinitely variable forward and reverse drive mechanical transmission has parallel input and output shafts, a pair of variable diameter drive pulleys fixed on the input shaft, a pair of driven pulleys rotatable upon the output shaft, belts interconnecting one pulley of each pair with an associated pulley of the other pair, planetary gearing comprising a pair of ring gears nonrotatably connected to the respective driven pulleys, a rotatable carrier mounting planet gears meshed with one of the ring gears, a fixed carrier mounting idler gears meshed



with the other ring gear and a common sun gear, and a single control lever is provided for inversely varying the effective diameters of the drive pulley.

3,670,595

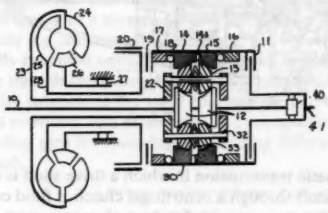
VARIABLE SPEED AUTOMATIC TRANSMISSION

Walter Valdemar Chery, 744 Alden Street, Meadville, Pa.

Filed Dec. 17, 1969, Ser. No. 885,912

Int. Cl. F16h *47/08, 13/08*

U.S. Cl. 74—688 **6 Claims**



This specification discloses an infinitely variable speed transmission. The transmission is made up of a friction planetary drive and a torque converter. The reactive member of the friction drive and the output of the torque converter are connected to the output of the transmission.

3,670,596

VEHICLE POWER TRANSMISSION WITH SERVICE BRAKES

Gilbert K. Hause, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

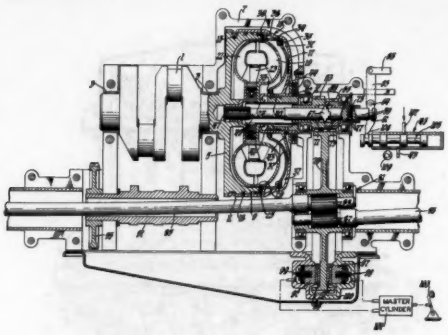
Division of Ser. No. 805,745, March 10, 1969, Pat. No. 3,590,966. This application Nov. 10, 1970, Ser. No. 88,457

Int. Cl. F16d *67/00*

U.S. Cl. 74—710.5 **8 Claims**

Power transmission in which the input rotor of a hydrodynamic torque-transmitting unit and a rotatable transmission input are selectively clutched and unclutched to control power flow through the unit. Controls associated with a gear selector mechanism for forward and reverse gearing effect the momentary disconnection of the input rotor and the transmission input when shifting gears. Disc brakes selectively engageable with the differential input provide vehicle service

brakes. The housing of the torque-transmitting unit is rigidly connected to the transmission input by deforming a portion of



the housing into appropriate openings formed in the transmission input.

3,670,597

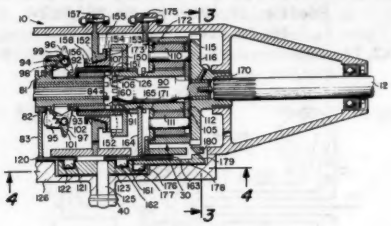
AUTOMATIC TRANSMISSION FOR AUTOMOTIVE VEHICLES

Worthin F. Grattan, 4224 South Bruce, Las Vegas, Nev.

Filed Nov. 25, 1970, Ser. No. 92,815

Int. Cl. F16h *5/42, 47/08;* **B60k** *29/00*

U.S. Cl. 74—752 E **4 Claims**



An automatic transmission in which a drive shaft is coupled to a driven shaft through a centrifugal clutch, a fluid coupling, a forward planetary gear and a rear planetary gear. A shift lever is activated to lock-up the rear planetary gear for drive, neutral, reverse, and parking. Thus, the rear planetary gear is initially locked-up when the shift lever is in the drive position. In low drive, power is transmitted from the drive shaft to the driven shaft through the centrifugal clutch, the fluid coupling, and the forward planetary gear. After the vehicle speed reaches 20 m.p.h., the forward planetary gear locks-up and power is transmitted from the drive shaft directly to the driven shaft. When the vehicle speed reaches 40 m.p.h., the rear planetary gear will automatically shift into overdrive, and power is transmitted from the drive shaft to the driven shaft through the rear planetary gear.

3,670,598

CONTROL SYSTEM FOR AN AUTOMOTIVE AUTOMATIC POWER TRANSMISSION

Yoichi Mohri, and Hirohisa Ichimura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

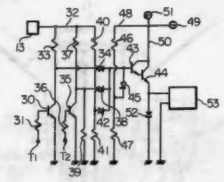
Filed Oct. 13, 1970, Ser. No. 80,283

Claims priority, application Japan, Oct. 14, 1969, 44/81753

Int. Cl. B60k *21/00*

U.S. Cl. 74—866 **4 Claims**

A control system for controlling the line pressure in a hydraulic control system of an automotive automatic power transmission in which a line pressure regulator valve is controlled by a variable back pressure produced by a servo valve which is actuated by an electronic control circuit in accordance with changes in vehicle speed. The voltage to be supplied to the servo valve is increased in proportion to the



turbine speed of a value and, when the turbine speed exceeds the predetermined value, the voltage to be applied to the servo valve remains constant. The line pressure is thus regulated in a manner to follow the output torque of the torque converter to thereby control the line pressure to an appropriate level for effecting smooth shifting between the gear ratios.

3,670,599

AUTOMATIC TRANSMISSION CONTROLS

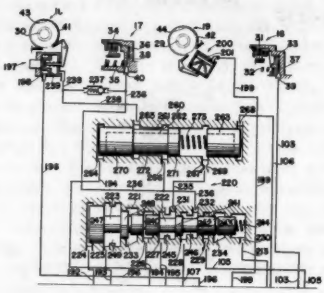
Hiroaki Nagamatsu, Hiroshima-shi, Japan, assignor to Toyo Kogyo Co., Ltd., Aza-Shinchi, Fuchu-cho, Aki-gun, Hiroshima-ken, Japan

Filed Oct. 8, 1969, Ser. No. 864,793

Claims priority, application Japan, Oct. 31, 1968, 43/79512

Int. Cl. B60k *21/02, 29/02*

U.S. Cl. 74—869 **3 Claims**



Automatic transmission controls for use in an automotive vehicle which improves smoothness and reduces pumping losses in automatic shifting by modifying the hydraulic pressure to be applied to friction engaging device in accordance with the torque output of the vehicle engine during normal driving of the vehicle and in accordance with the torque transmitted from the vehicle at the time of engine braking. The controls include a regulator valve operable to extend the operating range to high engine speed and to increase the varying rate at low speed, a timing valve effective to control the engaging time of a servo-motor operated at the low speed, a shift valve being capable to impart hysteresis thereto, and an inhibitor valve being adapted to prevent transmission into the low speed driving condition only if the vehicle driving speed exceeds over a predetermined speed.

3,670,600

CHAIN SAW FILING FIXTURE

Uwe F. Arff, Peterborough, Ontario, Canada, assignor to Outboard Marine Corporation, Waukegan, Ill.

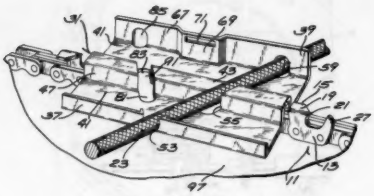
Filed Aug. 26, 1970, Ser. No. 67,014

Int. Cl. B23d *63/08*

U.S. Cl. 76—36 **10 Claims**

Disclosed herein is a filing fixture for sharpening a saw chain, which filing fixture comprises a filing plate having first

and second outer flanges extending respectively from the opposed outer edges of the filing plate and from one surface thereof and in generally perpendicular relation to the one surface. The filing plate also has, intermediate the opposed edges thereof, a channel shaped section including third and fourth flanges extending from said one filing plate surface in perpendicular relation thereto and connected by a web. In addition,

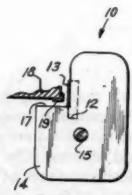


the filing fixture includes a slot in each of the flanges, the slots being in alignment with one another so as to afford guidance and/or clearance of a file movable in the slots. In addition, one of the first and second flanges includes an offset portion facilitating "point" of a saw chain. Still further, one saw chain filing fixture disclosed herein includes stabilizing legs selectively locatable in collapsed or extended position.

3,670,601
SKI EDGE SHARPENER

Francis G. Weeks, 721 Leslie Ave., Thunderbay, Ontario, Canada

Filed Sept. 10, 1970, Ser. No. 71,143
Int. Cl. B21k *17/00*
U.S. Cl. 76—83 **1 Claim**

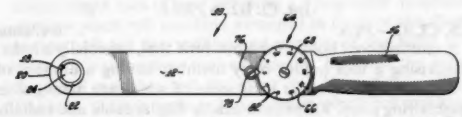


A ski sharpening device for skiers. This device consists of a plastic or wooden body having a file positioned within a recessed area in order to draw the device along the ski edge in order to sharpen it. The device has end plates for holding the file in place.

3,670,602
TORQUE LIMITING WRENCH

William E. Van Hoose, 4117 Brompton Ave., Bell, Calif.

Filed July 13, 1970, Ser. No. 54,194
Int. Cl. B25b
U.S. Cl. 81—52.4 **14 Claims**

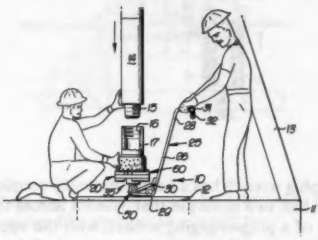


A torque limiting wrench adapted to tighten a fastener with either a right- or left-hand thread, which wrench will physically register a predetermined torque requirement when said torque limit is reached upon the tightening of said fastener. The wrench includes a body portion having a longitudinal axis and carried on said body portion and aligned parallel with said longitudinal axis is a deflectable means pivotally connected with said body portion. Mounted on the deflectable means is a conventional wrench socket head adapter to receive a wrench socket head. Release connecting means associated with said body portion and said deflectable means provided remote from the pivotal connection is adapted to be overcome by torque created between the body and fastener as it is tightened to allow the deflectable means to pivot out of parallel alignment with said body portion signaling that the predetermined torque has been reached by said fastener as it is tightened.

3,670,603
OIL WELL TOOL POSITIONING AND COUPLING STARTING APPARATUS

Harold R. Hawkins, 129 West 5th Ave., Anchorage, Alaska

Filed May 21, 1970, Ser. No. 39,321
Int. Cl. B25b *13/00*
U.S. Cl. 81—53 **12 Claims**

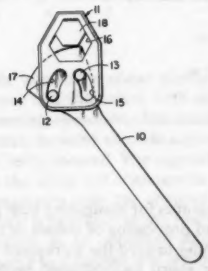


The apparatus has a rotatable table for receiving a heavy drill bit tool with a threaded upper end to be raised generally vertically by movement of a lever, to which the table is pivotally mounted until the threads of the drill bit engage the mating threads on the lower end of a suspended oil well string pipe with rotation of the table coupling the two together. The table is provided with extendable and retractable arms having upstanding pins for receiving and holding different sizes of oil well tools.

3,670,604
VARIABLE HEXAGON SPANNER

Rolf Ivar Fromell, Tabyvagen 71, Box 53, S-183 21 Taby, Sweden

Filed Jan. 18, 1971, Ser. No. 107,154
Claims priority, application Sweden, Jan. 28, 1970, 1060/70
Int. Cl. B25b *13/28*
U.S. Cl. 81—98 **10 Claims**



A variable hexagon spanner comprising a handle pivotally interconnected with a spanner head; the spanner head has a

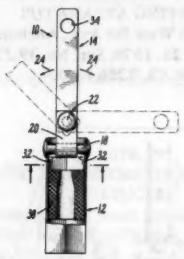
non-symmetrical hexagonal hole into which a cam portion on the handle protrudes a variable amount depending on the angular relationship between the handle and spanner head for positively gripping a hexagonal head positioned in the hole irrespective of the direction of movement of the handle.

3,670,605

SPARK PLUG WRENCH

Kenneth J. Heim, Douglaston, and Fred F. Rimmler, Manhasset, both of N.Y., assignors to A. L. Doering Mfg. Corp., Bayside, N.Y.

Filed Jan. 26, 1971, Ser. No. 109,809
Int. Cl. B25b *13/02*
U.S. Cl. 81—125 **8 Claims**



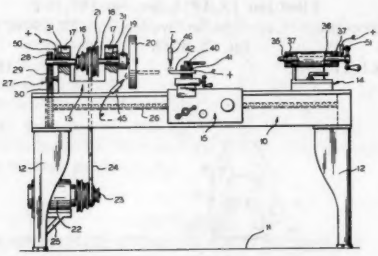
A spark plug wrench has a handle movably coupled through a U-shaped link to a pivot pin that extends across the opening at one end of a plug-engaging socket, with the upper ends of the link being pivotally attached to one end of the handle, so that a loose fitting universal joint is formed between the handle and the socket.

3,670,606

METHOD AND APPARATUS FOR COOLING THE WORKPIECE AND/OR THE CUTTING TOOLS OF A MACHINING APPARATUS

Oscar C. Blomgren, Sr., and Oscar C. Blomgren, Jr., both of Lake Bluff, Ill., assignors to Inter-Probe, Inc., Chicago, Ill.

Filed Oct. 12, 1970, Ser. No. 79,751
Int. Cl. B23b *1/00*
U.S. Cl. 82—1 C **7 Claims**



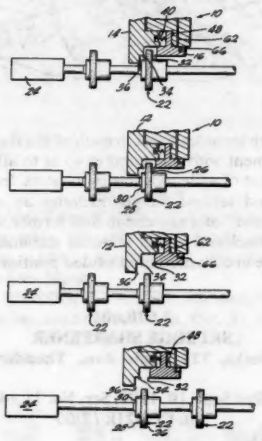
A method and apparatus for dissipating heat generated during the machining and processing of metals or other materials which includes directing toward the workpiece and/or cutting tool a needle-like or sharp tooth-shaped probe that is connected to a high voltage direct current potential, and electrically insulating the workpiece and cutting tool from the machine.

3,670,607

METHOD FOR MACHINING SPACED SURFACES

Frank C. Skrentner, Bloomfield Hills, Mich., assignor to LaSalle Machine Tool, Inc., Warren, Mich.

Division of Ser. No. 833,349, June 16, 1969, Pat. No. 3,592,089. This application March 29, 1971, Ser. No. 128,818
Int. Cl. B23b *1/00*
U.S. Cl. 82—1 C **2 Claims**



The method for finish machining parallel surfaces on a workpiece in which the machine tools which are movable across the surfaces to be machined are mounted on relatively movable supporting head sections. The tools are moved radially inwardly along opposite surfaces of a rotating workpiece, one of the head sections is then moved a predetermined distance in a direction to move the tool thereon away from the tool on the other head section, the workpiece is then moved in the same direction a smaller distance so that both surfaces are spaced from the tools, and the head is then retracted while the tools are spaced from the workpiece surfaces to positively preclude the formation of objectionable drawback lines on the workpieces.

3,670,608

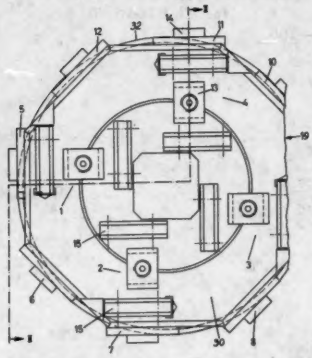
MULTIPLE TOOL HOLDER DEVICE

Otto Marzy, Steyr, Austria, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed March 31, 1970, Ser. No. 24,141
Claims priority, application Switzerland, April 7, 1969, 5250/69
Int. Cl. B23b *29/24*
U.S. Cl. 82—36 A **6 Claims**

A multiple tool holder for a machine tool, especially a lathe, comprising a tool holder body member having a number of tool receiving stations at least some of which are arranged in neighboring pairs. Respective axially displaceable and radially displaceable clamping elements are provided for each neighboring pair of tool receiving stations, which respective clamping elements are mounted at the tool holder body member. A common clamping mechanism is provided for the respective axially displaceable and radially displaceable

clamping elements of each neighboring pair of tool receiving stations, and a single eccentric bolt means is rotatably



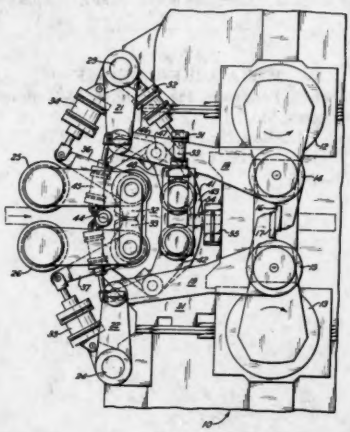
mounted at the tool holder body member for actuating each such common clamping mechanism.

3,670,609

METHOD AND APPARATUS FOR CONTROLLING SHEARING OF METALLIC WORKPIECES

Joseph Contaldo, Sewickley, and George Pripeton, Boyers, both of Pa., assignors to United Engineering and Foundry Company, Pittsburgh, Pa.

Filed Nov. 12, 1969, Ser. No. 875,655
Int. Cl. B23d *25/08*
U.S. Cl. 83—37 **5 Claims**



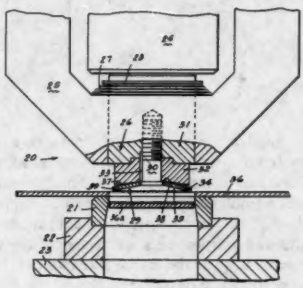
This disclosure relates to the art of producing predetermined length cuts of steel billets by a flying shear. It includes a primary pinch roll machine arranged in front of the shear to advance all but the trailing end portion of the billet to the shear for cutting into desired lengths. Between the primary pinch roll machine and the shear and immediately adjacent the shear, there is arranged a secondary pinch roll machine. A measuring roll is provided to measure the length of the billet, except for the trailing end thereof issuing to the shear. This measuring operation is employed to control the operation of the shear in cutting the billet into a number of desired length cuts. The trailing end portion of the billet is not measured by the measuring roll but instead by the second pinch roll machine, which also advances the trailing end portion to the shear.

3,670,610

METHOD AND MEANS FOR PUNCHING

Percy L. Cady, Jr., Darien Center, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Dec. 22, 1969, Ser. No. 886,986
Int. Cl. B26f *1/14*
U.S. Cl. 83—55 **31 Claims**



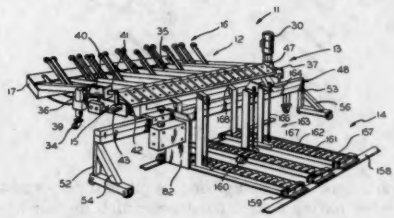
A method and means for punching includes the use of a resilient washer-like member as a punch tip.

3,670,611

SHEAR DISCHARGE CONVEYING SYSTEM

David J. Jarman, 3520 Michigan, Cincinnati, Ohio

Filed Jan. 6, 1971, Ser. No. 104,289
Int. Cl. B23d *33/00*
U.S. Cl. 83—81 **10 Claims**



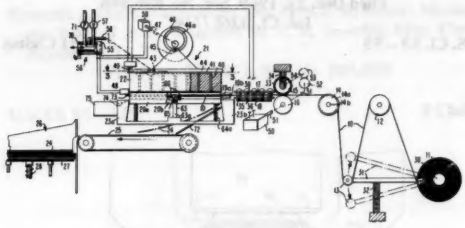
A portable automatic shear discharge conveying system which operates in conjunction with squaring shears to automate the shearing operation. The system comprises a unique conveyor which includes camless support units for supporting the material being sheared. The support units drop down automatically as the shear cut commences. The support units are raised automatically after the sheared material passes by. A scrap separator is provided at the rear of the conveyor which causes the scrap to be delivered to one bin and sends the sheared material to a stacker that is equipped for stacking odd shaped cuts. The stacker frame integrally includes the surge tank for the compressed air circuit used in controlling the conveyor system and stacker.

3,670,612

CARD CUTTING APPARATUS

Robert L. Johnson, and David W. Leach, both of Trenton, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1970, Ser. No. 40,976
Int. Cl. B65h 35/06
U.S. Cl. 83—99 7 Claims



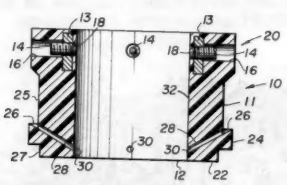
Cards are formed by intermittently die cutting both ends simultaneously from a web of polyester material, providing cards of a width equal to that of the web. This "cookie-cutter" approach leaves a small scrap strip between cards, but assures that the cards will be of consistently accurate length with precisely positioned corner cuts or rounded corners being formed at the same time as the transverse end cut. During the punching stroke, the uncoated side of the web is attracted by vacuum to the punch just before it enters the die; and two U-shaped movable guides that laterally support the web are spread apart to release the card as it is cut from the web; whereupon air under pressure is supplied to the punch to divert the scrap strip into a receptacle and release the card onto a conveyor for stacking.

3,670,613

PUNCH STRIPPER

Dominick Rienzi, 15 Jefferson St., Nutley, N.J.

Filed Aug. 24, 1970, Ser. No. 66,363
Int. Cl. B26d 7/06, 7/18
U.S. Cl. 83—139 15 Claims



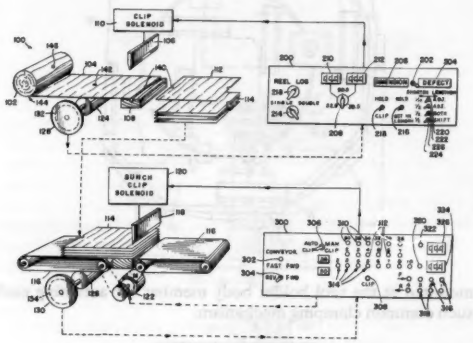
A punch stripper unit comprising an integral polyurethane body member having a steel band embedded therein which reinforces the body member and threadingly receives locking screws for securing a punch in a punch receiving hole passing through the body member. The polyurethane provides its own spring-back force when compressed during a punching operation to forcibly remove a punch member mounted in the stripper unit from a punched hole. The workpiece engaging surface of the polyurethane body does not mar workpieces being punched since polyurethane is non-abrasive. Further, an oil retaining reservoir in the form of a groove formed around the outside of the stripper unit communicates with the punch receiving hole via lubricating channels for continuously supplying lubricant between the surface of the punch receiving hole and a punch disposed therein. In addition, oil collecting means may be provided for lubricating the walls of the punching end of the punch for facilitating punching of a workpiece.

3,670,614

AUTOMATIC VENEER MEASURING AND CLIPPING CONTROL SYSTEM

Ernest H. Streckert, 609 North Road, Medford, Wis.

Filed Dec. 17, 1969, Ser. No. 885,917
Int. Cl. B26d 5/40
U.S. Cl. 83—208 16 Claims



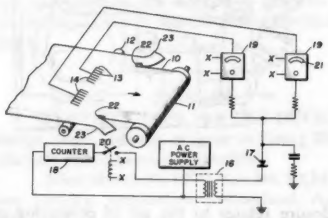
A solid state control system measures out the length of veneer cut from reel or log as it is moved by a conveyor and automatically clips the veneer to the desired length. The veneer can be automatically cut into sheets of any desired length, or it can be automatically clipped whenever a periodic knot or defect appears. After the veneer has been clipped into sheets and stacked, the stacks are semi-automatically shifted and are electronically measured and clipped into sections of the proper length for assembly into standard size panels.

3,670,615

WEB MARKING DEVICE

Robert F. Scholl, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 18, 1970, Ser. No. 90,537
Int. Cl. B26d 5/00
U.S. Cl. 83—367 3 Claims

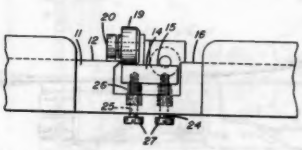


A marking device is employed in conjunction with a system for electrically detecting defects in a nonwoven web. The marking device uses the trimmings or waste portions of the web rather than marking the usable portion of the web. In response to a signal indicating the presence of a defect, the marking device moves the web laterally inward thereby leaving at least a portion of the trim attached to the web at the location of the defect.

3,670,616
CUTTING AND SPLICING APPARATUS

Stephen H. Miller, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 10, 1970, Ser. No. 53,722
Int. Cl. B26d 7/22
U.S. Cl. 83—397 3 Claims

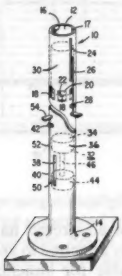


Apparatus for cutting a web and for supporting the web during the splicing thereof. The apparatus comprises two generally planar support members, one of which bears a cutting edge formed along a lateral extremity thereof. The other support member is moveable relative to the first and is normally positioned generally coplanar therewith and adjacent said cutting edge whereby the two members together effectively form a single support surface extending on either side of the cutting edge and whereby the operator's exposure to the cutting edge is minimized. A rotatable cutter wheel is suitably mounted for traversal of the cutting edge in cutting relationship therewith. During such traversal, a portion of the cutter wheel extending laterally above the moveable support member engages that member and displaces it from its normal position to a depressed position.

3,670,617
VACUUM PUMP OPERATED MUSICAL INSTRUMENT

Ernest Haile, 30 Cadwalader Terrace, Trenton, N.J.

Filed June 25, 1971, Ser. No. 156,837
Int. Cl. G10d 7/00
U.S. Cl. 84—330 12 Claims



A vacuum pump operated musical instrument is herein described which includes a hollow cylindrical body. The body is formed to define at least one aperture in the cylindrical wall thereof. The hollow body is open at one end and closed at the opposite end. A piston is slidably mounted within the cylindrical body for reciprocation past the aperture. As the piston is moved past the aperture, in a direction from the closed end to the opened end of the hollow body, the piston draws a vacuum and then suddenly communicates that vacuum to the ambient through the aperture. Air rushing in from the ambient into the vacuum space is acted upon the size and configuration of the aperture to form an audible sound.

A second piston arrangement may be disposed between the aperture and the closed end of the hollow body. The second piston arrangement may be manually positioned to vary the volume of the vacuum retaining space. The adjustment of the volume of the last mentioned space is operable to controllably vary the pitch of the sound caused by air rushing from ambient into that space.

Alternatively, a sleeve member may be coaxially and slidably mounted over the open end of the tubular shaped body so as to be adjustable with respect to the aperture. Axial movement of this sleeve member is operable to controllably vary the pitch of the sound in response to the position of the sleeve member.

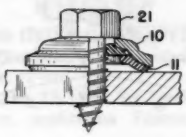
A one way valve is mounted within the first piston as a compression relief mechanism when the first piston is moved toward the closed end of the tubular body, before commencing the vacuum stroke.

If it is found that the vacuum formed between the two pistons is too great when both pistons are moved in opposite directions at the same time, the compression relief valve may be opened manually by a control mechanism associated with the first piston arrangement to dissipate some of the vacuum.

3,670,618
COMPOSITE WASHER

Paul J. Jellison, Pittsburgh, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Oct. 2, 1970, Ser. No. 77,610
Int. Cl. F16b 35/00, 43/00
U.S. Cl. 85—1 JP 9 Claims

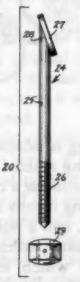


A composite washer having a dome-shaped metal member and a resilient member such as neoprene bonded thereto. The resilient member comprises two components, the first of which is bonded to the metal member along its bottom surface at the high portion of the dome and substantially adjacent the central opening, and the second component is positioned in partially overlapping relationship with the first component and is also bonded to the metal member along the bottom surface and radially removed from the washer central opening. The metal member is shaped to restrict the resilient member from moving radially outward and to urge a radially inward movement.

3,670,619
HORSESHOE FASTENER

William M. Coats, Route 3, Box 357, Huntsville, Ala.

Continuation-in-part of Ser. No. 749,820, Aug. 2, 1968, abandoned. This application Oct. 28, 1969, Ser. No. 871,850
Int. Cl. F16b 35/06
U.S. Cl. 85—9 1 Claim



A horseshoe fastener including a head member having an elongated straight shank supporting a planar head at a steep

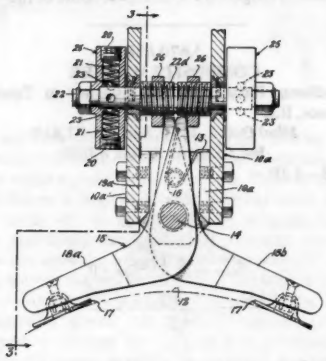
angle to the longitudinal axis of the shank for setting flush against the surface of a horse's hoof when the shank is extended through a hole through the shell of a hoof and a corresponding hole in a horseshoe, and a securing member for engaging the head member to secure the horseshoe to the hoof.

3,670,620

AUTOMATIC SWAY BRACE DEVICE

William Paraskewik, Lansdale, Pa., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 23, 1970, Ser. No. 92,039
Int. Cl. B64d 1/04
U.S. Cl. 89—1.5 B **1 Claim**



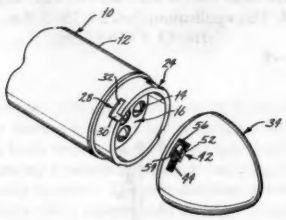
Automatic sway brace device for restraining stores mounted on an aircraft. Paired sets of scissored sway braces, restrained by clamps mounted on a threaded shaft, extend outward from the bottom of a rack for abutting a store secured in the rack.

3,670,621

ROCKET LAUNCHER FAIRING

John J. Nash, Ferguson, Mo., assignor to Alsco, Inc., St. Louis, Mo.

Filed Oct. 31, 1969, Ser. No. 872,842
Int. Cl. F41f 3/06
U.S. Cl. 89—1.8 **17 Claims**



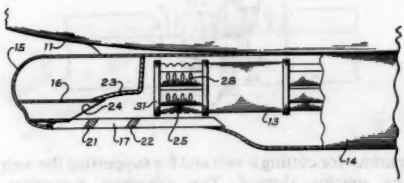
A rocket launcher fairing is adapted for use with an elongated rocket launcher having at least one rocket tube containing a rocket. The fairing includes a rim adapted to fit on one end of the launcher, securing means on the rim for detachably securing it to the launcher, and a polystyrene shell foamed in place around the rim so that it adheres to the rim. The shell forms a rounded surface which encloses the end of the launcher and which is adapted to shatter and break in response to the impact from the rockets when they exit from the tubes.

3,670,622

GUN BLAST STRIPPER AND DIFFUSER

William W. Bryant, Ferguson, and Richard T. Groff, Ladue, both of Mo., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 25, 1971, Ser. No. 109,405
Int. Cl. B64d 7/02; F41f 17/12
U.S. Cl. 89—14 C **3 Claims**



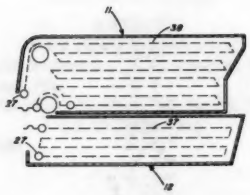
An apparatus for diffusing and directing the energy from a gun blast from aircraft mounted guns including a stripper attached to each said gun, said stripper having a plurality of openings for directing energy from a gun blast in a downward direction, a curved acceleration ramp positioned forward of said guns, and one or more cascades for directing energy downwardly.

3,670,623

AMMUNITION CONTAINER FOR AIRCRAFT

William Kuyper, Westminister, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 1, 1970, Ser. No. 51,425
Int. Cl. F41f 9/06
U.S. Cl. 89—34 **1 Claim**



An ammunition box for an aircraft having a first container adaptable to be removably attached to an aircraft and having a second container adaptable for attaching to said first container. The first container has an opening in its bottom and said second container has an opening in its end thereby providing access to ammunition belts within said containers for linking an ammunition belt in said second container with an ammunition belt in said first container.

3,670,624

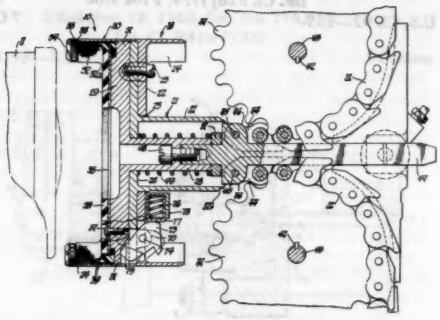
RAMMER HEAD

John R. Hayes, Indianapolis; Francis H. Eckart, Bargersville, and Donald E. Peck, Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1970, Ser. No. 93,606
Int. Cl. F41f 17/16
U.S. Cl. 89—47 **5 Claims**

A rammer head structure in which two entrapped flexible gripper segments, such as rubber gripper segments, are squeezed against the shoulder on the rear of an ammunition cartridge case at a loading station to securely grip the round of

ammunition and move it forward through a loading tube into the breech of a gun barrel with the rammer head structure being released from the round of ammunition after it has been partly positioned in the breech of the gun barrel.

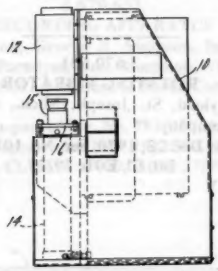


3,670,625

POT BROACHING MACHINE

Lily G. Skalsey, Detroit, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 15, 1970, Ser. No. 80,951
Int. Cl. B23d *41/06*
U.S. Cl. 90—86 9 Claims



A pot broach comprising an upright frame including a vertical broach adjacent the upper end of the frame. A piston and cylinder device is disposed below the broach and a work holder is provided on the upper end of the piston. Automatic loading mechanism slides a work piece into position above the work support on the piston. Guide means retains the work piece accurately located until it enters into the lower end of the broach.

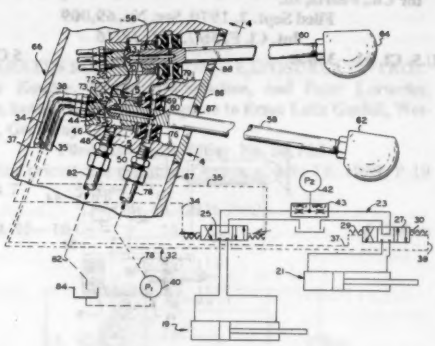
3,670,626

JET PIPE FLUID CONTROL

John E. Olson; Wayne W. Bostad, and Norman L. Price, all of Portland, Oreg., assignors to Hyster Company, Portland, Oreg.

Filed June 11, 1969, Ser. No. 832,212
Int. Cl. F15b *13/042, 13/68*
U.S. Cl. 91—3 24 Claims

A jet pipe fluid control having a nozzle which is movable in more than one plane into alignment with any one of a cluster of input openings for a series of fluid passages leading to fluid-actuated control valves. The valves control the flow of high pressure fluid to fluid motors which operate various load-handling apparatus of an industrial lift truck. A control handle at the operator's station of the truck moves the jet pipe into alignment with the desired opening for remote actuation of a control valve.

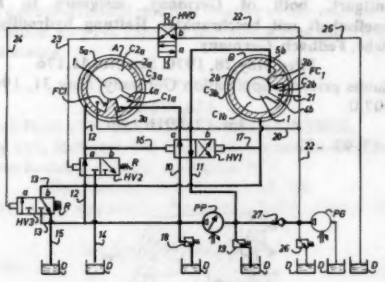


3,670,627

DEVICE FOR DRIVING A SHAFT IN ROTATION

Alfred Valantin, Clermont, France, assignor to Charbonnages De France, Paris, France

Filed Oct. 13, 1969, Ser. No. 865,918
Claims priority, application France, Oct. 15, 1968, 68170022
Int. Cl. F15b *11/18*; F01b *7/20*; F01c *9/00*
U.S. Cl. 91—167 6 Claims



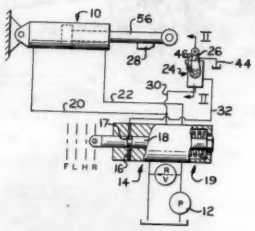
A device for driving a shaft in rotation, of the kind comprising at least one set of two identical rotary jacks mounted on a common shaft, the annular space comprised between the cylindrical casing of each jack and the shaft coaxial with this latter being divided into two fluid-tight chambers of variable volume, separated on the one hand by a longitudinal abutment provided on the internal face of the said cylindrical casing, and on the other hand by a radial blade fixed longitudinally in the said shaft, the cylindrical casing of each jack being provided with a device for locking it with respect to a housing by which said casing is enclosed.

It comprises: a hydraulic circuit composed of two portions connected to a common tank; a first portion supplied by a main pump and a second portion supplied by a topping-up pump; the locking device of the cylindrical casing of one jack being constituted by a cylindrical housing enclosing the jack casing and comprising a fluid-tight annular chamber, in which the wall in contact with the outer surface of this same casing is a thin wall, the said annular chamber being connected by means of a three-way distributor with two positions, either to the said main pump or the the common tank.

3,670,628
KICKOUT VALVE AND CIRCUIT

Herbert W. Borer, Naperville; John R. Cryder, and Edward A. Wirtz, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 2, 1970, Ser. No. 69,009
Int. Cl. F15b *13/01, 13/16*
U.S. Cl. 91—358 A 5 Claims

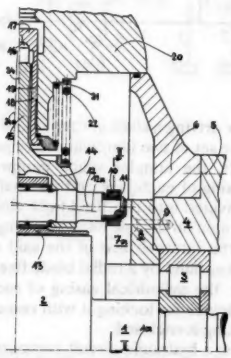


A kickout valve for use in a machine having a part moved by hydraulic pressure under control of a manual control valve which has a detent for holding it in an actuating position. The kickout valve is engaged when the movable part reaches a preestablished position. The valve is opened and admits fluid under pressure through a circuit leading to the control valve, where it causes release of the detent and allows the control valve to seek a closed or hold position and the moving part to come to rest.

3,670,629
RADIAL PISTON MACHINE

Emil Biernath, Stuttgart-Oberturkheim, and Hans Burkard, Stuttgart, both of Germany, assignors to Excentra Gesellschaft mit beschrankter Haftung hydraulische Antriebe, Fellbach, Germany

Filed May 28, 1970, Ser. No. 41,176
Claims priority, application Germany, May 31, 1969, P 19 27 807.0
Int. Cl. F01b *1/00*
U.S. Cl. 92—72 10 Claims

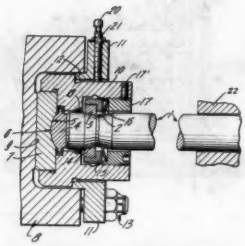


A radial piston machine having a casing formed with radially disposed cylinders containing pistons and a cam shaft which is rotatably mounted in the casing and guide shoes carried by the piston and engaging on the cam so that the transmission of power between the cam shaft and the piston takes place through the guide shoe.

3,670,630
RESILIENT CONNECTING MEANS

Henry K. Tyson, and Karl W. Wikelski, both of Odessa, Tex., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed Dec. 15, 1969, Ser. No. 884,999
Int. Cl. F16j *1/14*; F16c *9/00*
U.S. Cl. 92—129 7 Claims

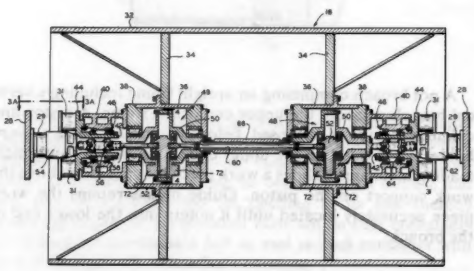


A connecting means is disclosed for resiliently connecting an elongate member to a driving means for imparting motion to the elongate member and is particularly suitable for connecting piston rods to driving heads of compressor systems. The connecting means includes a shoulder means adapted to be secured to the elongate member adjacent that end of the member to be secured to the driving means, a retaining means adapted to be secured to the driving means and which encompasses both the shoulder means and elongate member in spaced apart relationship, and a resilient member interposed between the retaining means and shoulder means for urging the shoulder means and elongate member toward the driving means.

3,670,631
ROTATING VIBRATOR

Richard P. Gaylord, St. Joseph, Mich., assignor to Clark Equipment Company

Filed Dec. 28, 1970, Ser. No. 101,892
Int. Cl. E01c *19/28*
U.S. Cl. 94—50 V 7 Claims



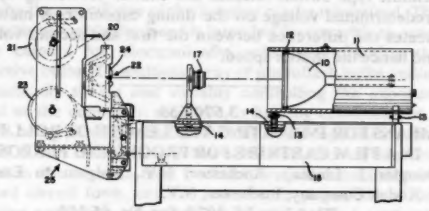
A vibrator has two rotating eccentric masses which are interlocked to operate at the same speed. The eccentric masses are arranged so that one is movable circumferentially during rotation relative to the other to change between a vibrating condition and a non-vibrating condition. Two individual motors may be utilized to drive the eccentric masses, and means are provided for changing the relative torque outputs of the motors to shift one eccentric mass relative to the other to change between the vibrating condition and the non-vibrating condition.

3,670,632

PHOTOTYPESETTING APPARATUS

Arthur J. Stanton, Warrensville Heights; Edwin R. Kolb, Cleveland, and Webster C. Roberts, South Euclid, all of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Nov. 18, 1968, Ser. No. 776,738
Int. Cl. B41b 19/08
U.S. Cl. 95—4.5 R 3 Claims



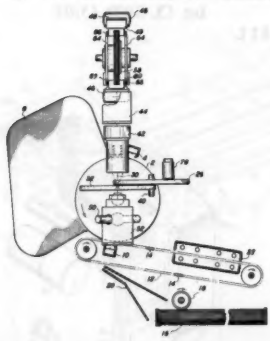
A device for expanding the effective width Of an image forming surface, such as the face of a cathode ray tube, on which characters are formed in proper succession to make up lines of composition includes a carriage supporting photographic material, which is in optical alignment with the image forming surface, for permanently recording the images thus formed on the display surface, the carriage being movable from a first position, where a large portion of the photographic material is exposed to the image formed on the tube, to a second position where the remainder of the photographic material is placed within the field of view of the image forming surface.

3,670,633

RECORDING APPARATUS

Lawrence J. Mason; George R. Simpson, both of Webster, N.Y.; Louis F. Paradysz, East Randolph, Vt., and Philip L. Chen, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 791,050, Jan. 14, 1969, abandoned. This application Nov. 19, 1970, Ser. No. 91,192
Int. Cl. B41b 13/00; G03b 27/70
U.S. Cl. 95—4.5 R 12 Claims



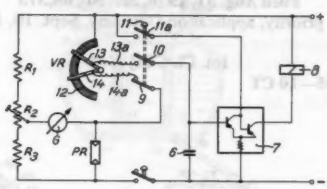
An alphanumeric recording system wherein a character disc having transparent character images thereon is rotated through an exposure zone so that selected characters may be projected by the energization of a flash lamp. The projected image is collimated and directed to a recording zone through which move lens-mirror units at a constant speed intercept the projected image and focus it onto a photoreceptive recording medium. The character disc rotates at a rate such that with the slits therein associated with respective characters inter-character spacing is assured. Dead time in the recording process is eliminated by the use of the collimated projected character image and plural interception of that image.

3,670,634

APPARATUS FOR ELECTRONIC EXPOSURE CONTROL

Arthur Kessler, Grosse Altenstadten, and Peter Lorseries, Diez, both of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed May 5, 1970, Ser. No. 34,723
Claims priority, application Germany, July 18, 1969, P 19 36 544.7
Int. Cl. G03b 7/02
U.S. Cl. 95—10 C 6 Claims



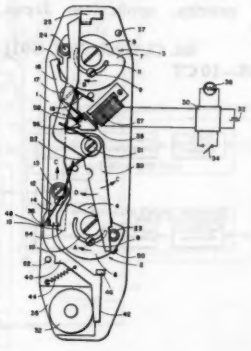
An apparatus for electronic exposure control in photographic cameras comprising a measuring circuit in the form of a resistance bridge circuit including meter, and a timing circuit, which includes a resistance-capacitor combination (RC-combination). Only one variable resistance is provided for the two circuits which is an exponentially variable resistance having two wipers. The two wipers are electrically isolated from one another, and one wiper is included in the measuring circuit, the other one in the timing circuit. In dependence on the film speed and/or the selected F-stop number of wipers are adjusted to a predetermined position relative to one another, and in this position they are together movable across the windings of the resistance.

3,670,635

AUTOMATIC SHUTTER-SPEED CONTROL

Wolfgang Ort, Stuttgart-Bad Cannstatt, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 8, 1970, Ser. No. 44,394
Claims priority, application Germany, June 6, 1969, P 19 28 877.8
Int. Cl. G03b 7/08, 9/58
U.S. Cl. 95—10 C 5 Claims



In a camera having a photoelectric system for establishing shutter speed, means are provided for detecting the presence

of a predetermined condition in the photoelectric control system and for establishing a predetermined exposure interval independently of the photoelectric control system in response to the detection of such a predetermined condition. In the preferred embodiment, the photoelectric control system includes a time-delay circuit energizable by a battery in a receptacle, and the camera includes a mechanical shutter control having a predetermined speed which is actuated in response to detection by a sensing arm of the absence of a battery in a battery receptacle.

3,670,636

APPARATUS FOR CONTROLLING THE SHUTTER SPEED OF PHOTOGRAPHIC CAMERAS

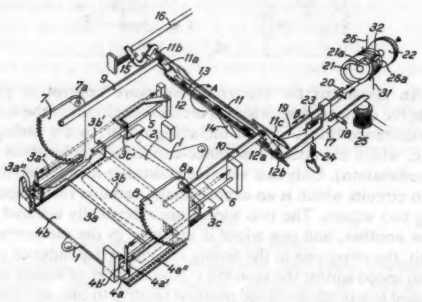
Werner Holle, Wetzlar, and Arthur Kessler, Grossaltenstadten, both of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed Aug. 31, 1970, Ser. No. 68,373

Claims priority, application Germany, Sept. 10, 1969, P 19 45 709.1

Int. Cl. G01j *1/44*

U.S. Cl. 95—10 CT **5 Claims**



Apparatus for controlling the shutter speed of photographic cameras which includes mechanical components for controlling the shutter speed in the short-time range combined with an electric timing circuit and an electromagnet for effecting control in the long-time range.

3,670,637

AUTOMATIC TIMING NETWORK FOR CAMERA SHUTTERS

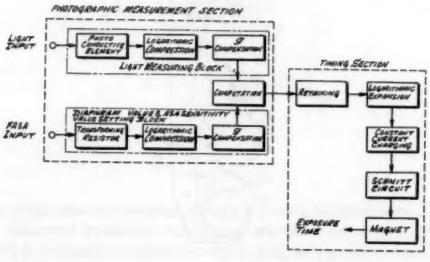
Chiharu Mori, and Toru Nakajima, both of Tokyo-to, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Nov. 25, 1968, Ser. No. 778,433

Claims priority, application Japan, Nov. 28, 1967, 42/75897

Int. Cl. G03b *7/08*; **G01j** *1/44*

U.S. Cl. 95—10 CT **11 Claims**



A camera shutter timing network includes a photoconductor connected in series with a plurality of diodes, the voltage across the diodes which is a logarithmic function of the photoconductor incident light is amplified by a variable gain amplifier to produce a first voltage. A second diode network combined with variable resistors and an amplifier produces a second voltage which is a logarithmic function of the camera diaphragm opening and film speed rating. A memory capacitor is charged to the difference of the two voltages and a timing capacitor is charged through a diode type logarithmic expansion network at a constant rate dependent on the memory capacitor voltage. An electromagnet energized through a Schmitt type switch releases the shutter to closing upon a predetermined voltage on the timing capacitor. A meter indicates the difference between the first and second voltages and hence the shutter speed.

3,670,638

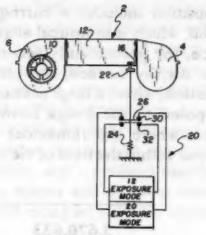
MEANS FOR INDICATING THE LENGTH OF ROLL FILM IN A FILM CARTRIDGE FOR PROCESSING PURPOSES

Douglas J. Lindsay, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 15, 1970, Ser. No. 46,359

Int. Cl. G03b *1/60, 17/26*; **G03d** *13/00*

U.S. Cl. 95—31 CA **2 Claims**



A film cartridge defines a discontinuity indicative of the length of the film in the cartridge for determining the mode of operation of a film processor used to process the film.

3,670,639

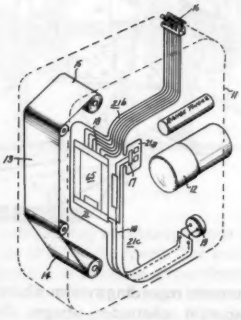
FLEXIBLE ELECTRONIC INTEGRATED CIRCUIT CAMERA CONTROL ASSEMBLY

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 16, 1968, Ser. No. 791,846

Int. Cl. G03b *15/03*

U.S. Cl. 95—11 L **13 Claims**



An electronic integrated circuit assembly intended for the control of automatic cameras comprises a flexible, electrically insulating, supporting member having a plurality of electronic control sub-circuits formed thereon including both active

semiconductor devices and passive circuit components and the electrically conductive paths interconnecting the active semiconductor devices and passive circuit components in electrical circuit relationships for performing a desired sub-circuit control function, and further including the conductive paths required to energize the sub-circuits and supply the outputs thereof to others of the sub-circuits and to the respective sub-systems being controlled. The assembly is entirely flexible and capable of being intertwined and disposed in otherwise unuseable, irregular spaces in the interior of a housing whereby the overall size of the housing can be minimized. The particular assembly disclosed is intended for use with an automatic camera for electronically, selectively flashing the respective bulbs of a multiple array of photoflash bulbs and/or automatically timing and variably controlling the exposure period of the camera in response to lighting conditions of a subject being photographed to thereby obtain optimum exposure of a film frame. The active semiconductor device employed in the circuits may be fabricated in monolithic integrated circuit form, and the assembly is provided with an overlying protective electrical insulating layer that conforms substantially to the silhouette of the assembly and which extends over substantially the entire surface of the assembly on the side opposite the flexible insulating member excluding any contact areas for external connections. The assembly may comprise a hybrid, integrated circuit with the conductive paths being formed by laminated conductive runs of an electrically conductive material such as copper formed on the insulating supporting member by known printed conductor techniques with the passive circuit element including at least one capacitor of the pumpkin seed variety. Alternatively, the assembly may be fabricated using thin film circuit techniques.

3,670,640

ROOF TOP FOR MOTOR VEHICLES

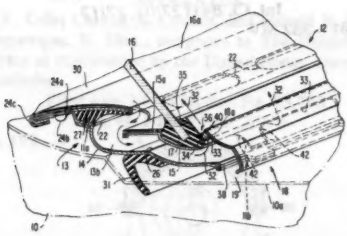
Hans Gotz, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft

Filed May 20, 1970, Ser. No. 39,090

Claims priority, application Germany, May 24, 1969, P 19 26 612.7

Int. Cl. B60h 1/24

U.S. Cl. 98—2.18 **20 Claims**



A roof top for motor vehicles which is adapted to be detachably secured to the lower vehicle body and which includes a lower rear cross frame that forms a relatively wide gap with the top side of the rear part of the vehicle body; this gap which terminates at its rear end in the atmosphere, forms part of a line system of a ventilation installation for the passenger space; a ventilating channel is branched off from this line system whose air flow fans the outer surface of the rear window.

3,670,641

BEVERAGE INFUSION APPARATUS, FOR EXAMPLE COFFEE

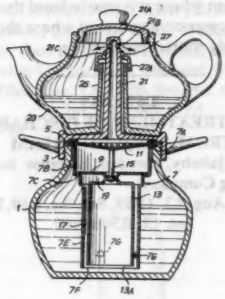
Luciano Mancioli, Localita Il Cartolaro, Montelupo, Italy

Filed Dec. 24, 1970, Ser. No. 101,271

Claims priority, application Italy, Dec. 31, 1969, 4915

Int. Cl. A47j 31/043

U.S. Cl. 99—293 **6 Claims**



Home coffeepot including a boiler, a coffee powder chamber with permeable upper and lower walls, a water rise passage extending downwardly from said chamber towards the boiler bottom, and a conduct extended upwardly for the outlet of the beverage formed by the hot water passing through the powder, the water being urged into said rise passage and into the conduct by steam pressure generated by heating of the boiler. A bell member is arranged in the boiler to set up a steam dome, wherein steam is continuously generated by heating; the rise passage extends with annular cross-section around this bell wherein the generated steam is discharged and rises together with the boiler's water.

3,670,642

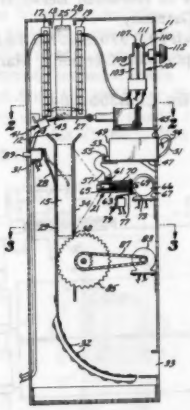
COMBINATION TOASTING AND BUTTERING APPARATUS

Robert N. Bergman, 1766 Molino, Long Beach, Calif.

Filed Sept. 14, 1970, Ser. No. 71,863

Int. Cl. A47j 37/06

U.S. Cl. 99—329 RT **6 Claims**



A combination toasting and buttering apparatus including a housing formed with a passage leading from an upper heating compartment to a lower buttering compartment. Heating

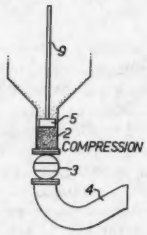
means is disposed in the upper compartment and support means is provided for supporting a slice of bread disposed in heat exchange relationship with the heating elements. A shortening applicator is disposed in the lower compartment for applying shortening to toast as it passes therethrough and advancing means is provided for advancing the bread slice from the upper compartment to the lower compartment. Actuating means is provided for actuating the applicator as the bread is advanced to the lower compartment for applying shortening to the bread slice as it is passed through the lower compartment whereby a slice of bread may be introduced into the upper compartment where it is toasted and then automatically advanced to the lower compartment where the applicator will automatically apply shortening thereto.

3,670,643

METHOD FOR TREATMENT OF DISCHARGED SOLIDS FROM A LIQUID STREAM

Kurt W. Fihn, Hjalteby, Sweden, assignor to Esso Research and Engineering Company

Filed Aug. 13, 1969, Ser. No. 849,754
Int. Cl. B30b *9/02*
U.S. Cl. 100—37 **2 Claims**



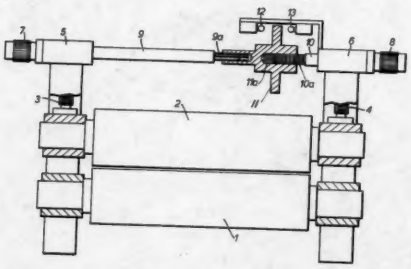
Solids, separated out from a liquid in a tank, are compressed in the tank to remove entrained liquid which flows back to the main body of liquid, and the compressed solids removed. The process, preferably, is continuous with solids discharge valve opening on the compression stroke of the compressing device. Preferably a back pressure is provided in the discharge pipe.

3,670,644

CALENDER ROLL ADJUSTMENT APPARATUS

Heinz Hoever, Gehrden, and Herbert Orth, Misburg, both of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover, Germany

Filed March 10, 1970, Ser. No. 18,033
Claims priority, application Germany, March 12, 1969, P 19 12 392.3
Int. Cl. B30b *3/04*
U.S. Cl. 100—168 **4 Claims**



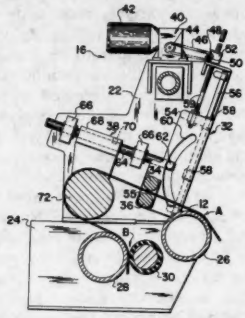
Apparatus for adjusting the spacing between parallel calender rolls comprises a respective motor for moving each end portion of one of the rolls. Differences in the speeds of the motors causes movement of a member to switch off the motors.

3,670,645

DECURLING METHOD AND APPARATUS

D. Brian R. Hill, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed March 30, 1970, Ser. No. 23,879
Int. Cl. B41f *5/06, 13/02*
U.S. Cl. 101—181 **13 Claims**



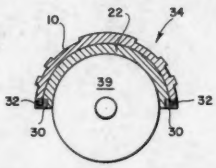
A decurling method and the associated apparatus are usable with a printing system or the like incorporating a series of stations for performing operations upon a web as the web is advanced in predetermined registered relationship with the stations. An elongated decurling member over which the web is drawn imparts to the web a tendency to curl which compensates for an objectionable curl tendency imparted to the web by the system or curl tendency previously existing in the web. The relative positions of the web and the decurling member are adjustable in a manner which produces change in the magnitude of the compensating curl tendency imparted to the web without influencing the path length of the web.

3,670,646

MAGNETICALLY SECURABLE PRINTING PLATE

Vergil B. Welch, Jr., Ellicott City, Md., assignor to W. R. Grace & Co.

Filed Oct. 9, 1970, Ser. No. 79,606
Int. Cl. B41f *27/02, 27/12*
U.S. Cl. 101—382 MV **1 Claim**



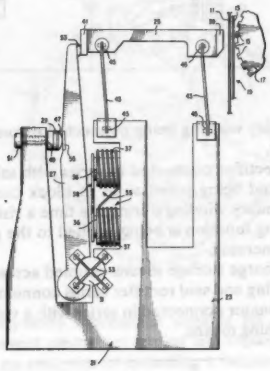
The invention disclosed is directed to a flexible printing plate having magnetic particles disposed in nonprinting regions thereof and to a method for removably securing the plate to a printing press element having magnetic means associated therewith. Also disclosed is a printing press saddle having magnetic means for cooperating with the printing plate disposed magnetic particles to removably secure the plate to the saddle for printing use. The present invention provides an effective means for rapidly replacing printing plates used in high-speed printing operations.

3,670,647

METHOD OF DAMPING REBOUND OF PRINT HAMMER

John W. Funk, Dearborn, Mich., and Kishor M. Lakhani, Saugas, Mass., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 20, 1969, Ser. No. 878,313
Int. Cl. B41j 9/42, 9/38, 9/36
U.S. Cl. 101—426 3 Claims



A method of oscillation-free print hammer and return is provided in an apparatus having an inertial hammer, a relay and a resilient backstop. In this method the armature of the relay is pivotably mounted and imparts motion to the hammer. The solenoid of the relay physically restrains the motion of the armature and then holds the armature by residual magnetism. The hammer continues in inertial flight until it reaches the printing area. On rebound the hammer strikes the armature and part of the kinetic energy of the hammer is absorbed as the hammer drives the armature free from the residual magnetic field. The armature and hammer continue to the backstop which absorbs or dissipates the remainder of the kinetic energy. The absorption of kinetic energy is for damping hammer oscillations and permits higher frequency of operation.

3,670,648

LINEAR STRUCTURE CAPTURING AND CUTTING APPARATUS

James K. Cole; Carroll A. Coonce, and Harold N. Post, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 14, 1970, Ser. No. 63,788
Int. Cl. F42b 25/02, 25/16
U.S. Cl. 102—4 8 Claims

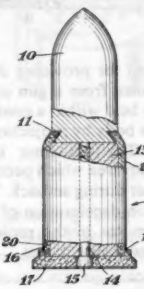
Apparatus for capturing and cutting a linear structure such as a cable comprising collector arms hingedly interconnected adjacent ends thereof, means for swinging distal ends of the arms away from each other to form an inverted V and for limiting the spread of the arms, shaped explosive charge means adjacent the interconnected ends for producing an explosive jet that is aimed or directed generally toward a captured linear structure, and means for initiating the shaped explosive charge means upon suitably capturing the structure or cable.

3,670,649

COMBUSTIBLE CARTRIDGES

Robert C. Hartlein; James D. Kiles; Willard D. Larson, all of Midland, and Carl R. Olson, Freeland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 13, 1970, Ser. No. 63,537
Int. Cl. F42b 9/16
U.S. Cl. 102—38 13 Claims



Nonmetallic cartridges having a porous casing of fiber-reinforced nitrocellulose are rendered oil and water resistant by first incorporating into the casing an organosilicon compound which renders the casing material essentially impervious to liquid water but which does not substantially alter the porosity of the material and then providing a continuous coating on the surface of the casing, the coating being a room temperature curing resinous organosiloxane having from 1.2 to 1.8 organic substituents per silicon atom, the major portion of the organic substituents being lower alkyl and/or phenyl radicals.

3,670,650

SHOTSHELL WAD

Francis Hamnet Garland McCaffrey, Brownsburg, Quebec; Jack Garnett McIndoe, and Herbert Rigg, both of Lachute, Quebec, all of Canada, assignors to Canadian Industries Limited, Montreal, Quebec, Canada

Filed April 19, 1971, Ser. No. 135,095
Claims priority, application Canada, June 10, 1970, 085160
Int. Cl. F42b 7/08
U.S. Cl. 102—42 C 4 Claims

A two part wad column for use in shotshells is provided which consists of an overpowder component comprising inner

and outer concentric cylindrical walls attached to a skirted and plate and a shot container component comprising a cup-shaped shot container and a skirted end plate which abutts the outer cylindrical wall of the overpowder component.

3,670,651

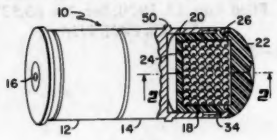
AMMUNITION ROUND

William J. Mertens, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed April 21, 1971, Ser. No. 135,997

Int. Cl. F42b 7/08

U.S. Cl. 102—42 C **8 Claims**



An ammunition round for providing deployment of a plurality of shot at a distance from a gun or launcher muzzle is disclosed. The shot are held within a container secured to the front end of a projectile body by projections on both the ogive and container body. The container is provided with a weakened shear or clamp area which permits separation of the ogive from the container during setback. The shot is deployed from the container upon deceleration of the projectile body. The use of a rocket motor in the projectile will delay the deployment until after rocket burn-out.

3,670,652

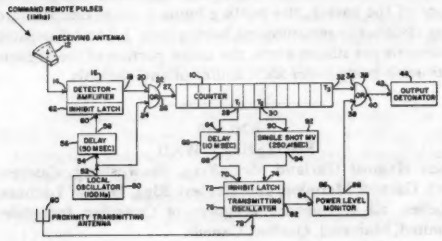
CONTROLLED RANGE PROXIMITY FUZE

Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company

Filed May 11, 1970, Ser. No. 36,118

Int. Cl. F42c 13/00, 11/00, 9/00

U.S. Cl. 102—70.2 P **5 Claims**



An electronic, digital time fuze has a counter which also serves as a serial programmer and which may be remotely preset while in flight to enable a proximity detector circuit at a first predetermined range, and to self detonate the fuze, if not sooner detonated by the proximity detector circuit, at a second predetermined range.

3,670,653

SELF-POWERED FUZE FIRING SYSTEM

Wilbur B. Lunt, Arlington, and Robert A. Haskell, Long Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 16, 1963, Ser. No. 316,770

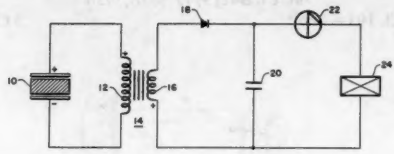
Int. Cl. F42c 11/02, 7/00, 15/20

U.S. Cl. 102—70.2 R **6 Claims**

1. A self-powered fuze firing system that will initiate moderate energy wire-bridge detonators comprising:

a. piezoelectric impact generator having first and second electrodes for generating an output signal voltage when deformed on impact,

b. a transformer having a primary winding and a secondary winding,



c. said primary winding being connected across said impact generator,

d. a diode rectifier connected in series with said secondary winding and being poled so as to block current flow in said secondary winding during the time a rising compressive forcing function is being applied to the piezoelectric impact generator,

e. electric charge storage means coupled across said secondary winding and said rectifier series connected circuit,

f. and a detonator connected in series with a voltage responsive switching means.

3,670,654

CONTROL AND SAFE-STARTING DEVICE FOR USE IN A DETACHABLE MISSILE

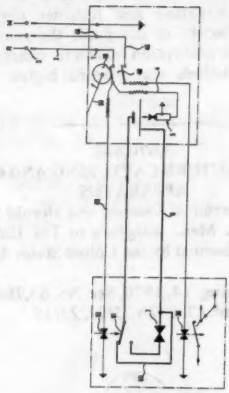
Jean Billot, Levallois, France, assignor to Rafaut & Cie

Filed May 11, 1970, Ser. No. 36,239

Claims priority, application France, May 13, 1969, 6915443

Int. Cl. F42b 15/00

U.S. Cl. 102—70.26A **10 Claims**



This invention relates to a safe-starting device for a detachable missile fed with current from a source situated on board a vehicle carrying the missile, by means of a cable connected to a removable terminal.

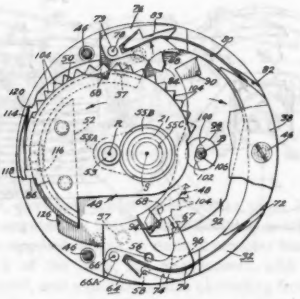
In the actual missile housing between a starting mechanism and a current input fed by said cable, there is a provided a time-delay relay in which the electric current emanating from the carrier vehicle is converted into mechanical energy which actuates a transducer capable of supplying an electric current intended to be used directly or to ensure control of the starting mechanism.

This device increases the safety of using detachable missiles while at the same time enabling the length of the feed cable to be reduced.

3,670,655
TIMING MECHANISM

Thomas J. Krupa, Willingboro, N.J., assignor to Delaware Valley Armaments, Inc., Mount Laurel, N.J.

Filed June 9, 1970, Ser. No. 44,698
Int. Cl. F42c *15/24*
U.S. Cl. 102—79 **9 Claims**



An arming-delay mechanism suitable for use in artillery shells to prevent premature arming and explosion of the shell, employing an escapement including a balance which is "unbalanced" in that its pivot axis is radially further outward than its center of gravity with respect to the spin axis about which the mechanism spins after the shell is fired. It also includes two sequentially operating centrifugal detents for preventing accidental starting of the operation of the timing mechanism prior to firing of the shell, with the balance arranged to serve as an interlock between the two detents whereby the second detent cannot be actuated to its open position until after the first detent has been actuated. Arming is produced, after spinning of the shell releases both detents in sequence, by means of a centrifugally operated rotor having escapement teeth on it, which teeth engage the balance directly rather than through a gear train. The unbalanced balance responds to centrifugal forces produced during spinning to resist motion of the rotor more strongly than a "balanced" balance of the same mass, making possible a smaller, lighter and simpler mechanism for a given amount of delay, and the sequentially operating arrangement of detents provides a high degree of safety from premature accidental arming.

3,670,656
FUZE ARMING DEVICE

William J. Donahue, Takoma Park; David L. Blanchard, Silver Spring, and John M. Wack, Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 26, 1965, Ser. No. 428,264
Int. Cl. F42c *5/02*
U.S. Cl. 102—81 **13 Claims**

1. A safety and arming device for an ordnance fuze comprising:

a housing having an explosive initiator mounted therein and being connected to the fuze,

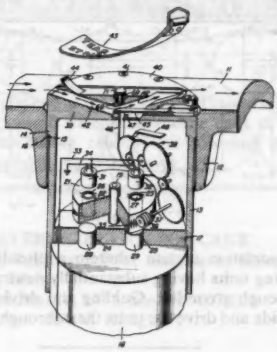
an arming rotor rotatably moUnted within said housing adjacent said initiator,

said arming rotor having an explosive detonator mounted therein for detonation by said initiator and transmission of that detonation to the main charge of the ordnance item,

said arming rotor being normally held in a safety position wherein said detonator is rotatably out of line with said initiator to prevent ignition of said detonator by said initiator and being rotatably movable to an armed position wherein said initiator and said detonator are aligned to provide a continuous detonation path from the initiator to the main charge,

air flow responsive means mounted upon said housing for vibratory response at its natural frequency when exposed to air velocities in excess of a predetermined minimum velocity, and

motion translating means connected to said flow responsive



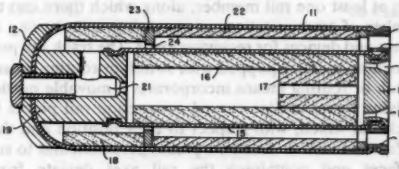
means and to said arming rotor,

whereby vibration of the flow responsive means at its natural resonant frequency for a predetermined duration of time will cause the arming rotor to be moved from its safety position to its armed position.

3,670,657
SIGNAL FLARE

Robert W. Evans, Herndon, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 30, 1970, Ser. No. 33,396
Int. Cl. F42b *11/16, 13/34, 13/40*
U.S. Cl. 102—87 **4 Claims**

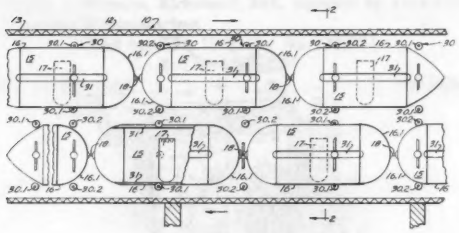


A signal flare having a container with a plurality of propulsion nozzles in the aft end and having a propellant charge therein. A flare propellant is provided in the forward end of the container and is arranged to be ignited by the burning of the propellant charge. A plurality of flare nozzles are also provided in the aft end of the signal container and a quantity of flare dye is positioned between the flare propellant and the flare nozzles. The contact of hot flare propellant gases with the flare dye causes ablation of the flare dye so that the dye colors the hot flare propellant gases which are dispersed through the flare nozzles.

3,670,658
TRANSPORTATION SYSTEM

Mogens Stelling, 1275 Pacific Street, Vancouver, 5 British Columbia, Canada

Filed July 9, 1970, Ser. No. 53,576
Int. Cl. B64b *1/50*; B61b *13/12*
U.S. Cl. 104—22 **3 Claims**

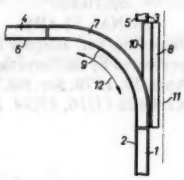


A transportation system wherein a plurality of gas filled load-carrying units having substantially neutral buoyancy are moved through a conduit. Guiding and driving rollers in the conduit guide and drive the units therethrough.

3,670,659
TRANSPORTATION INSTALLATION

Eugen Schurch, Gerlafingen, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed April 14, 1970, Ser. No. 28,440
Claims priority, application Switzerland, April 17, 1969, 5816/69
Int. Cl. E01b *25/26*
U.S. Cl. 104—101 **12 Claims**



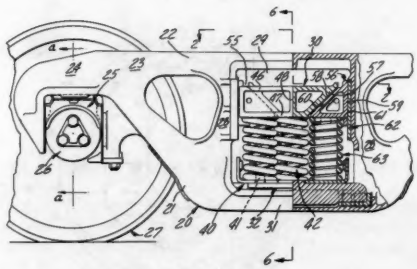
A transportation installation incorporating a horizontal and/or vertical and/or inclined extending track rail equipped with at least one rail member, along which there can travel a number of transportation or conveying units having a drive means and devices for receiving loads. The track rail possesses branching points equipped with switch or routing means. The switch or routing means incorporates a movable portion embodying linear and/or curved connection rail pieces for the track rail which, with respect to their position and their rail surfaces as well as also their planes perpendicular to such rail surfaces and containing the rail axes deviate from one another.

3,670,660
DAMPENED RAILWAY CAR TRUCK

Hans B. Weber, Bedford, and Joseph Brown, Warrensville Heights, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Aug. 4, 1969, Ser. No. 847,025
Int. Cl. B61f *5/06, 5/12, 5/38*
U.S. Cl. 105—171 **11 Claims**

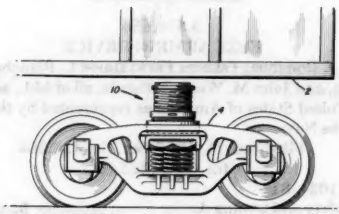
A four-wheel, two-axle railway car truck having non-integral side frames, a spring plank and a bolster, functioning both as a swing motion truck and a roll control truck and having its side frames journaled on the associated wheel and axle assemblies for swinging movement of the side frames transversely of the truck. The truck has a first stop means on the bolster for restricting the lateral movement of the bolster relative to the side frames at a level below the plane containing the longitudinal axes of the axles and second stop means associated with the spring plank and side frames for limiting the swinging movement of the side frames.



3,670,661
RESILIENT ROLL CONTROLLING RAILWAY CAR SIDE BEARINGS

Frans V. A. Pangalila, Matawan Township, N.J., assignor to John J. McMullen Associates, Inc., New York, N.Y.

Filed March 2, 1970, Ser. No. 15,809
Int. Cl. B61f *5/14*; F16c *17/04, 19/54*
U.S. Cl. 105—199 A **21 Claims**

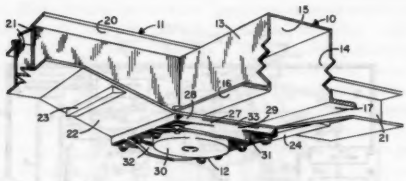


A device for positively establishing a maximum allowable roll angle for a railway car, without detracting from the capability of the car to move, in a horizontal plane, relative to its trucks. The device utilizes a strong but yet resilient rubber-like material in limiting the roll of the car. In some instances, the material is combined with shock absorbing coil springs, in others, it serves, itself, as the roll limiter, and still in another, the material is combined with a plurality of steel cylinders.

3,670,662
CAR BODY BOLSTER CENTER PLATE ASSEMBLY

Stanley H. Fillion, Wilmette, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 31, 1970, Ser. No. 68,293
Int. Cl. B61f *1/00, 5/16;* F16c *17/00*
U.S. Cl. 105—199 C 5 Claims

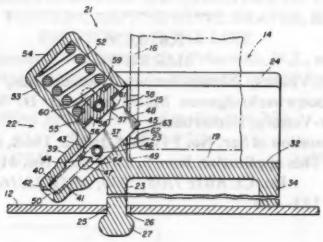


An integral, preferably cast steel center plate includes a generally rectangular flat base portion defining spaced mounting flanges on opposite edges. A central circular boss extends from one face of the base, for engagement with a mating center plate bowl, and a pair of beams extending from the one face between the mounting flanges on opposite sides of the boss. In assembly to a car underframe, the mounting plate flanges are bolted to the longitudinal supporting flanges of the center sill with the beams stiffening the center plate for better resistance of eccentric forces.

3,670,663
DEVICE FOR AUTOMATICALLY LATCHING A CONTAINER TO A RAILWAY CAR OR THE LIKE AND FOR AUTOMATICALLY UNLATCHING IT THEREFROM

Theodore J. Sweger, Naperville, Ill., assignor to Illinois Railway Equipment Company, Chicago, Ill.

Filed April 30, 1968, Ser. No. 725,363
Int. Cl. B60p *7/08;* B65j *1/22*
U.S. Cl. 105—366 C 34 Claims



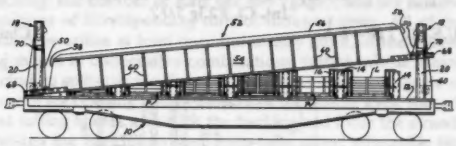
A container fitting is automatically latched to a railway car or the like as a direct result of lowering the container thereon, is held in latched position against the action of any usual forces likely to be encountered by the car in transit, and is automatically unlatched when the container is lifted from the car by a force sufficient to overcome the force of gravity acting on the container and the force of a spring maintaining the latched condition at each corner of the container.

3,670,664
MOVABLE COVER FOR RAILWAY FLAT CARS

Duane V. Thornton, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,502
Int. Cl. B61d *39/00*
U.S. Cl. 105—377 2 Claims

A cover adapted to fit over lading carried on the deck of a flat car. A hoist is provided on a vertically extending support at each end of the flat car to raise the cover to permit loading and unloading of lading from the sides of the flat car, such as by a forklift truck or the like. For movement of the cover to a

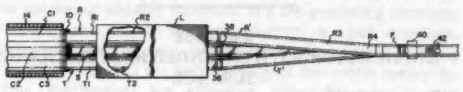


raised position, one end of the cover is first raised and then the opposite end is raised. Extensions on the ends of the cover guide the cover during raising and lowering thereof to minimize any lateral tilting of the cover.

3,670,665
LAYERING DEVICE FOR CAKE

George A. Levi, Saginaw, Mich., assignor to Baker Perkins, Inc., Saginaw, Mich.

Filed Jan. 18, 1971, Ser. No. 107,139
Int. Cl. A23g *3/00*
U.S. Cl. 99—92 15 Claims

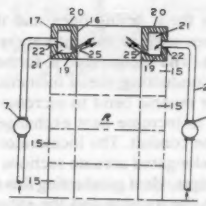


An apparatus and a method of making products such as layered cake comprising an oven for receiving and baking food product passed therethrough, a band conveyor for conveying a plurality of continuous strips of food product, such as cake, through said oven in side-by-side relation, and a plurality of conveyors for receiving the baked strips of food product from the band conveyor and transposing the strips into vertically superposed, stacked relation.

3,670,666
FLOW CONTROL AND DAMPING MEANS

James A. Herman, Royal Oak, Mich., assignor to Prenco Manufacturing Co., Royal Oak, Mich.

Filed July 27, 1970, Ser. No. 58,545
Int. Cl. F23g *7/00*
U.S. Cl. 110—7 R 16 Claims



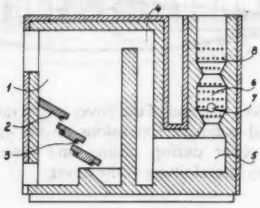
The rate of passage of a current of fluid moving in one direction through, or out of, a conduit is modified by means of a counter-current of similar or different fluid moving in a direction thereby impeding the passage of said current and prolonging its dwell time in such conduit.

3,670,667

INCINERATOR FOR THE COMBUSTION OF WASTE PRODUCTS, PARTICULARLY PLASTIC MATERIALS

Bent Faurholdt, Tornerosevej 134, 2730 Herlev, Denmark

Filed April 24, 1970, Ser. No. 31,507
Int. Cl. F23g 5/12
U.S. Cl. 110—8 A 8 Claims



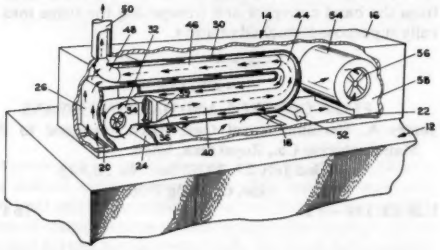
In an incinerator comprising two combustion chambers, the primary combustion chamber comprising refractory ceramic elements located adjacent to one another so as to form inclined continuous guide surfaces and means for supplying primary combustion air to said primary combustion chamber opening into said chamber at different levels above the bottom thereof.

3,670,668

INCINERATOR WITH EXTENDED HEAT EXCHANGE SURFACE

William A. Phillips, Comstock Park, Mich., assignor to Granco Equipment, Inc., Grand Rapids, Mich.

Filed Jan. 8, 1971, Ser. No. 104,912
Int. Cl. F23g 7/00
U.S. Cl. 110—8 A 17 Claims



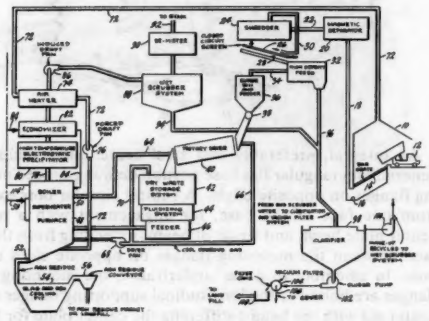
An incinerator for a drying oven and the like to remove combustible fumes such as solvent vapors from the exhaust from such ovens. The incinerator is formed from a narrow, elongated, heat conducting, metal incinerator conduit having at least one U or reverse bend to increase turbulance within the conduit and to increase heat exchange of hot gases with the exterior of the conduit. The incinerator conduit is formed of a plurality of elongated arcuate sections which are secured together at the edges. Heat conducting fins extend through the conduit between the interior and the exterior thereof at the edges of the arcuate sections to facilitate heat transfer between the interior and exterior of the incinerator conduit. The fume-laden gases to be incinerated are channelled along the exterior surface of the incinerator conduit in contact with the heat exchange fins by a larger preheat conduit surrounding the incinerator conduit. A fan draws the solvent-laden gases through the larger preheat conduit and forces the preheated gases into the incinerator conduit at a higher pressure than that of the preheat conduit.

3,670,669

PROCESS FOR DISPOSAL OF COMBUSTIBLE WASTE

John G. Hoad, Dearborn, Mich., assignor to John G. Hoad & Associates, Ypsilanti, Mich.

Filed Dec. 16, 1970, Ser. No. 98,559
Int. Cl. F23g 5/04
U.S. Cl. 110—8 R 14 Claims



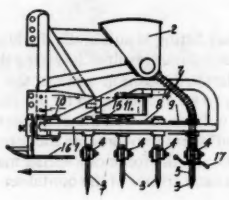
Combustible waste material is collected and processed after which it is disposed of by incineration, the energy derived from combustion being utilized to produce electrical energy. Included in the processing of the waste material are the steps of shredding the waste material, feeding the shredded material through a high density press to separate the dry matter from the liquids, heating the shredded material to drive off additional moisture and gases, fluidizing and feeding the dried shredded material into the incinerator.

3,670,670

HARROWS

Herbert Vissers, Nieuw-Vennep, Netherlands, assignor to Landbouwwerktuigenen Machinefabriek H. Vissers N.V., Nieuw-Vennep, Netherlands

Continuation of Ser. No. 741,944, July 2, 1968, abandoned.
This application June 5, 1970, Ser. No. 41,780
Int. Cl. A01c 7/08, 5/00; A01b 33/16
U.S. Cl. 111—10 8 Claims



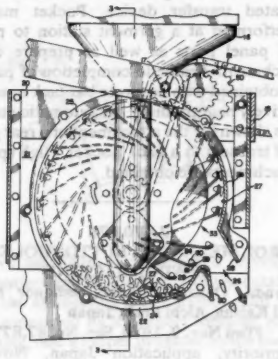
The invention relates to a harrow having one or more transversely reciprocating teeth carrying beams and further having a device for sowing seeds. The teeth of said reciprocating harrow beam or beams are each provided or united with a channel extending longitudinal of the tooth and said channel at its upper end is connected to a seed supply and has at or near its lower end an outlet.

3,670,671

PLANTER

Dario Lienemann, Clarendon Hills, and Daniel Henry, Downers Grove, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 6, 1970, Ser. No. 998
Int. Cl. A01c 7/18; G01f 11/20
U.S. Cl. 111—77 3 Claims



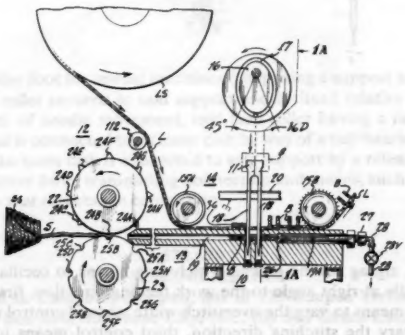
A planter for seed of different size of shape wherein a seed wheel or rotor is rotatably mounted in a housing having a stationary wall surrounding the rotor and a seed supply. Inwardly yieldable fingers are mounted on the rotor to pass through the seed supply, select a seed and press it against the wall, said wall being adapted to urge the fingers inwardly and having an outlet therein accommodating outward movement of the successive of said fingers to discharge the seed.

3,670,672

TUFTING MACHINES FOR MANUFACTURE OF TUFTED FABRICS, TUFTED CARPETS, RUGS, DRAPES, HEAVY FABRICS, AND THE LIKE

Abram N. Spanel, 344 Stockton St., Princeton, N.J., and John L. Schwartz, Hightstown, N.J., assignors to said Spanel, by said Schwartz

Filed June 25, 1969, Ser. No. 836,399
Int. Cl. D05c 15/34
U.S. Cl. 112—79 R 27 Claims



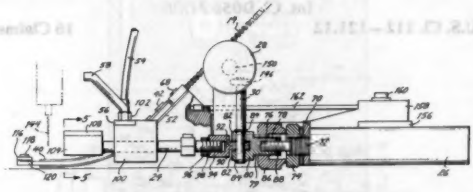
Tufting machines for making U-tufts and/or loop-tufts on a backing. The tufts may be made of the same or different heights and from strands of tufting material having the same or different color or other characteristics. Some machines form U-tufts and/or loop-tufts from discrete bits of tufting material whereas others form loop-tufts and/or U-tufts from a continuous strand. For tufts of the same or different color and of the same or different length, the pile pattern may be changed by controlling the number of rows of tufts per unit length of the backing; the number of tufts per row (gage), and the relative positions of corresponding tufts of different rows. All of the machines utilize at least one, and usually more, of the following means in cooperative combinations; tufting needle means including split-eye needles of novel construction and mode of control for opening and/or closure of the needle eyes: forked-end tufting blades which slit the backing and force the strands through the backing to form loop-tufts; novel adjustable bit-stop means at the tufting stations; strand-clamping means of novel construction at the tufting stations and/or in advance of strand-severing means; strand-severing means of novel rotary cutter and anvil construction used in various combinations of single cutter/single anvil, multiple-cutter/single anvil, and multiple-cutter/multiple anvil to supply a tufting station with tufting material of selected length and/or of selected color or other characteristics: novel cutter/anvil arrangements for making cut and/or uncut loop-tufts from continuous strands and in which blades of the cutter slit the backing, force the strands through the backing into the anvil recesses, and, for cut loop-tufts, cooperate with knife means in anvil recesses: for slitting the backing, the tufting blades may be fixed to a rotary member, or may be retractibly mounted on a rotary cutter member, fixedly attached to a reciprocating member, slidably mounted in a stationary member and operated by a cam or other means, or slidably mounted in a reciprocating member; the tufting anvil may be a rotary structure or a belt structure, segmented or continuous, having upstanding recess-forming elements attached to the belt or integral therewith: means including mechanism for effecting adjustable step-by-step lengthwise feed of the backing; means including novel mechanism for effecting relative motion between the backing and a row of tufting-needle means in direction laterally of the lengthwise feed of the backing.

3,670,673

BUTTON FEED DEVICE

Eric Winston, Melrose Park, and Herbert V. Jacobs, Lower Merion, both of Pa., assignors to Jacobs Machine Corporation, West Conshohocken, Pa.

Filed Aug. 25, 1970, Ser. No. 66,777
Int. Cl. D05b 3/22
U.S. Cl. 112—113 14 Claims



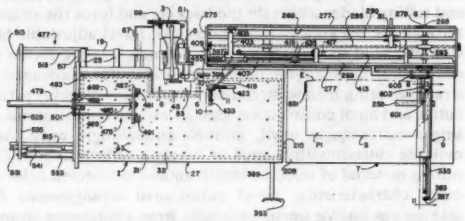
A button feed device comprising insert arm means to orient and transfer buttons from an engaging station to a sewing station, lifting means to sequentially raise and lower the insert arm means, pin means extending from the insert arm means and adapted to move relative to each other in a first direction to an orienting position when contacting the surface of a button to engage certain of the sewing holes of the button with the pin means again returning to a normal position, but engaged in the button holes in order to orient the button by no later than the time drive means transport the insert arm and engaged button to the sewing station.

3,670,674

AUTOMATIC FEEDER FOR WORKPIECES OF FABRIC OR THE LIKE

William R. Conner, Jr., Shelbyville, Tenn., assignor to Kellwood Company, St. Louis, Mo.

Filed April 30, 1970, Ser. No. 33,378
Int. Cl. D05b *33/00*
U.S. Cl. 112—121.29 9 Claims



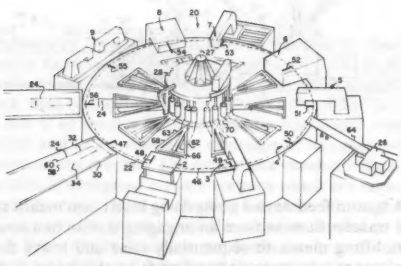
Apparatus for automatically feeding workpieces of fabric or similar limp material one after another from a stack of workpieces and delivering each workpiece to a sewing machine for a sewing operation along an edge of the workpiece. The top workpiece of the stack is picked off by means of a roller which rolls up the top workpiece of the stack, advances it to a position spaced from the stack, and then retracts to unroll the workpiece, whereupon a feed device takes over to feed the workpiece into a sewing machine to start the sewing operation. The sewing machine then takes over, and the workpiece is fed through the sewing machine by the feed device of the sewing machine and stitched. In being fed through the sewing machine, the workpiece is automatically guided for contour stitching along an edge thereof. A stacker is provided on the exit side of the sewing machine for automatically stacking completed workpieces exiting from the sewing machine.

3,670,675

METHOD AND SYSTEM FOR ATTACHING A POCKET TO A PORTION OF A GARMENT

Herman Rovin, Norwalk, Conn.; James W. Cobb, Tarrytown, N.Y.; Theodore Opuszenski, Darian, Conn.; Richard H. Willard, Norwalk, Conn.; Raymond Rigat, Jr., Monroe, Conn., and Joseph Pellicano, Greenwich, Conn., assignors to Ivanhoe Research Corporation c/o Robert A. Hack, New York, N.Y.

Filed Sept. 11, 1969, Ser. No. 857,012
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.12 16 Claims



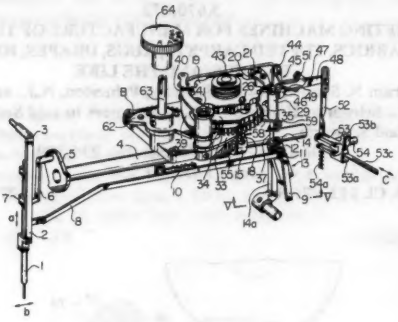
A system and method of fastening a pocket to a portion of a garment is described. Garment working stations are arranged in a preselected manner about a platform with predetermined accurate alignment of their individual garment working operations. Each garment portion is automatically deposited on the platform and aligned with an orientation selected to bring its desired working areas with precision opposite the garment working stations. A garment portion indexer is employed which clamps the panel to preserve its automatically obtained alignment effectively throughout the working operations. The indexer accurately indexes the aligned panel step by step to each of the stations continuously retaining its grip until that is no longer needed. Pockets are deposited on the platform and automatically aligned with a selected indexed panel position. The pocket is attached to the panel at a precisely determined panel location after being transferred thereto with an automatic actuated transfer device. Pocket manipulation is uniquely performed at a garment station to precisely align pocket and panel parts as well as prepare completion of pocket attachment. Aesthetic completion of panel to pocket assembly is obtained with accurate bar tack operations, assuring a repetitively neat product. An automatic panel dart forming station is shown for the attachment of a rear garment panel for a pair of trousers to a back pocket. High speed pocket to garment attachments are obtained.

3,670,676

CONTROL MEANS FOR BUTTONHOLE ZIGZAG SEWING MACHINE

Toshio Sawada, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi Pref., Japan

Filed Nov. 9, 1970, Ser. No. 87,877
Claims priority, application Japan, Nov. 10, 1969, 44/89943
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 B 5 Claims



A zigzag sewing machine including means to oscillate the needle at right angle to the work feeding direction, first control means to vary the overstitch width, second control means to vary the stitching direction, third control means to vary needle stitching position, and manual control means for the sewing of buttonholes. The manual control means is operably connected to control cam means to have said control cam means actuated together so as to engage with cooperating follower means at corresponding tracks of said control cam means.

3,670,677

LOOPER DRIVE MECHANISM

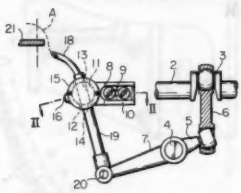
Tetsuro Hirayama, Tokyo, Japan, assignor to Tokyo Juki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 21, 1970, Ser. No. 73,914

Claims priority, application Japan, Sept. 25, 1969, 44/76452

Int. Cl. D05b *1/06*

U.S. Cl. 112—199 3 Claims



A looper drive mechanism comprises a driving shaft or crank shaft, a connecting rod connected to the crank shaft, an arm coupled to the connecting rod, a looper shaft connected to the arm and supported by a support member mounted to the sewing machine, and a looper provided to the looper shaft.

3,670,678

ROLLER-FOOT FOR SEWING MACHINES

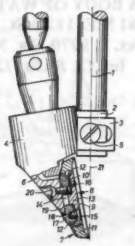
Hans Ziegler, Kaiserslautern, upper Palatinate, Germany, assignor to Pfaff Industriemaschinen GmbH, Kaiserslautern, Pfalz, Western, Germany

Filed Jan. 4, 1971, Ser. No. 103,745

Claims priority, application Germany, May 6, 1970, P 70 17 001.3

Int. Cl. D05b *29/00*

U.S. Cl. 112—235 3 Claims



A roller foot for sewing machines comprising a support and a feed roller secured to said support and inclined relative to the path of needle movement, said feed roller having a race ring that is connected to an inner disk by way of a ball bearing, while the inner disk is connected to said support by a releasable positive force transmitting connection and means, such as a screw that secures the connection.

3,670,679

CUFF MAKING METHOD

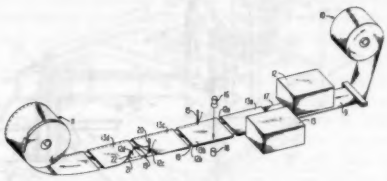
Richard D. Campbell, deceased, late of 135 Yaupon Terrace, P.O. Box 296, Morehead City, N.C. (by Sue Green Campbell, executrix)

Filed Sept. 4, 1970, Ser. No. 69,526

Int. Cl. D05b *1/00*

U.S. Cl. 112—262 7 Claims

A shirt sleeve cuff making method and apparatus wherein a continuous length of cuff lining material is passed through tandem sewing heads, and pairs of cuff panels are placed upon the lining material and are sewn along their aligned edges to one edge of the lining material by one sewing head and the overlying edge of the lower cuff panel of each pair is folded downwardly about the opposite edge of the lining material and sewn thereto by the other sewing head. The continuous lining material with the cuff panels sewn thereto are then passed to a second sewing station where the lining material is cut between the pairs of cuff panels and the edges of the cuff panels adjacent the cut in the lining material are sewn to the lining material.



3,670,680

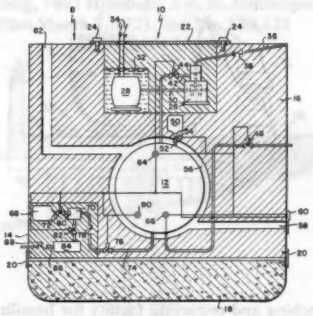
WATER EXPULSION SYSTEM

Frederick A. Kriedt, 604 Alma St. S.E., Vienna, Va.

Filed Sept. 25, 1970, Ser. No. 75,461

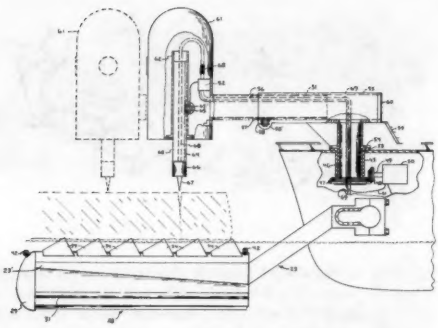
Int. Cl. B63g *8/00*

U.S. Cl. 114—16 R 12 Claims



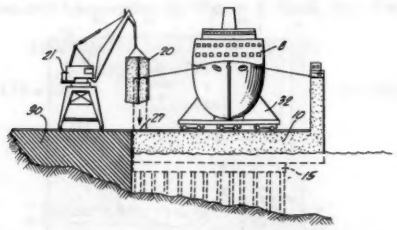
The present invention is an improvement for use in deep-water hydraulic power units, utilizing a chemical reaction to generate a gas to evacuate a chamber into which ambient seawater is passed after being throttled through a hydraulic motor.

3,670,681
SHIP MOUNTED ICE BREAKING SYSTEM
Thomas B. Upchurch, Jr., 101 Magnolia St., Raeford, N.C.
Filed May 15, 1970, Ser. No. 37,566
Int. Cl. B63b *35/08*
U.S. Cl. 114—40 8 Claims



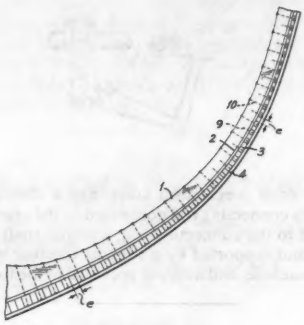
In abstract, a preferred embodiment of this invention is a ship capable of cruising at relatively high speed in open water while still having capability of breaking up large ice floes with a combination of a saw toothed upwardly biased, under ice stressing member and an above ice, downwardly projecting, variable position, chisel type ice cracking means.

3,670,682
METHOD AND APPARATUS FOR HANDLING SHIPS
Clyde M. Leavitt; Walter C. Johnson, both of Pascagoula, and Don C. Hall, IV, Ocean Springs, all of Miss., assignors to Litton Systems, Inc., Beverly Hills, Calif.
Filed Jan. 2, 1970, Ser. No. 9
Int. Cl. B63c *1/02, 3/04, 3/08*
U.S. Cl. 114—45 18 Claims



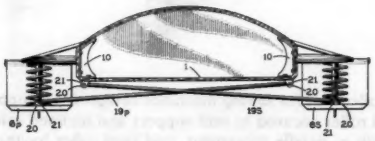
A launching and retrieving facility for handling ships with an open ended, sectionally constructed drydock having one side of removable wingwalls. In an inshore position the drydock is ballasted to rest upon a firm foundation and a track system on the drydock floor aligns with a similar shore-based track system thereby allowing the ship to be rollably or slidably transferred between the drydock and shore. After the ship is transferred to the drydock, the wingwalls are set in place and the drydock deballasted to float off the foundation. The drydock and ship thereon are moved into the launching area where the drydock is ballasted down until the ship is set afloat. Ship retrieval from water to shore is achieved by a reverse procedure.

3,670,683
HULLS OF THE SHIPS AND THEIR METHODS OF CONSTRUCTION
Bernard Jean Pierre Louis Lucien Bruniaux, Chatenay Malabry, and Roger Jean Le Corre, Courrevoie, both of France, assignors to Etat Francais-Delegation Ministerielle Pour L'Armement, Paris, France
Filed June 25, 1970, Ser. No. 49,865
Claims priority, application France, June 25, 1969, 6921218
Int. Cl. B63b *3/00*
U.S. Cl. 114—65 R 9 Claims



A hull of a ship comprises a plurality of longitudinally spaced transverse frames on which are mounted in succession, a first continuous skin, a plurality of spaced longitudinal ribs and a second continuous skin. The skins and ribs are assembled on the frames with the latter in inverted position, and the assembly is inverted when completed.

3,670,684
POWER DRIVEN VEHICLE FOR SURFACE TRAVEL ON A BODY OF WATER
George J. Helker, 1261 N.E. 112th St., Miami, Fla.
Filed Oct. 2, 1970, Ser. No. 77,556
Int. Cl. B63b *1/22*
U.S. Cl. 114—66.5 P 3 Claims

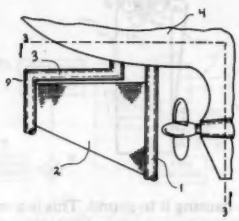


A power driven vehicle for travel on a body of water which maintains static flotation by means of a hull and is provided with articulated skis or pontoons for surface travel when power driven, including independent shock absorbing suspension connections between each ski or pontoon and the hull for negotiating rough water with minimum shock transmission to the hull.

ERRATUM

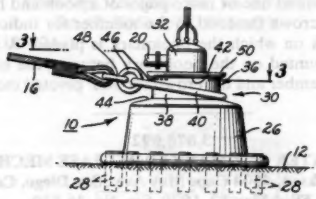
For Class 114—74 see:
Patent No. 3,671,315

3,670,685
FLEXIBLE RUDDER
Aldo Milessa, 171 Avenue B, New York, N.Y.
Filed Aug. 3, 1970, Ser. No. 60,264
Int. Cl. B63h *25/06*
U.S. Cl. 114—162 1 Claim



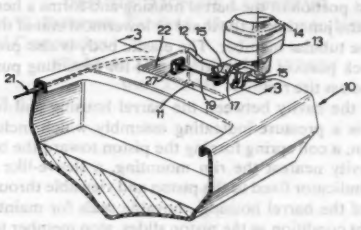
A vessel rudder consisting of a woven plastic water deflecting plate of a substantially trapezoid shape tensionally supported by a vertical slotted rod which is positioned in the center plane of the vessel's stern. A rudder stock is also positioned in the center plane. But aft of the vertical slotted rod a distance approximately equal to one fourth of the rudder plate's total maximum length. There is also fixed on the aft side another slotted rod supporting the back end of the woven plastic plate. And by turning the rudder stock plate it assumes a longitudinally curved shape for deflecting the water sideways.

3,670,686
SUBMERGED MOORING SYSTEM
David G. Reynolds, 13952 Dunton Drive, Whittier, Calif.
Filed Sept. 22, 1970, Ser. No. 74,293
Int. Cl. B63b *21/00*
U.S. Cl. 114—230 5 Claims



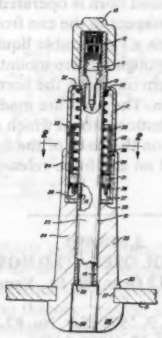
A submerged mooring system for a tanker which is being loaded, or unloaded. The mooring system permits the tanker to drift with the wind and/or current while maintaining the bow of the tanker headed toward the anchor point. The mooring system incorporates a swivel which rotates around a vertical axis as the heading of the tanker changes with variations in the wind and/or current. The swivel comprises a column means, a circular mooring ring loosely encircling and slidable circumferentially around the column means, means for retaining the mooring ring on the column means, and a slip ring linked with and slidable circumferentially of the mooring ring, the mooring line being connected to the slip ring. A hose for loading or unloading the tanker extends between the tanker and the mooring system and the mooring system incorporates another swivel which permits the hose to swivel about the same axis as the mooring swivel in response to changes in the heading of the tanker.

3,670,687
BOAT HAVING PIVOTALLY MOUNTED STEERING MECHANISM
Ernest W. Rowley, 13952 Dunton Drive, Willowdale, Ontario, Canada
Filed April 30, 1970, Ser. No. 33,295
Int. Cl. B63h *21/26*
U.S. Cl. 115—18 R 9 Claims



A boat having a transom which constitutes the stern wall of a well provided in the boat, an outboard motor being pivotally mounted on the transom with a portion of the outboard motor having pivotally connected thereto, at a spaced distance from the axis about which the motor is pivotally mounted on the transom, one end of a rigid actuating rod which is slidably disposed within a guide tube. The guide tube is disposed through an opening in a side wall of the well and presents the ball of a watertight ball and socket joint, the socket of which is constituted by the portion of the side wall bounding the entire opening through the thickness of the side wall whereby the socket extends across the entire thickness of said side wall. Thus, pivotal movement of the actuating rod, and of the guide tube within which the rod is disposed, is permitted about the ball and socket joint in order to accommodate pivotal movement of the outboard motor, while even if water enters the well by passing over the transom, this water is prevented from passing from the well through the opening in the side wall thereof into the interior of the hull of the boat. Passage of water into the interior of the hull of the boat could of course result in the boat being swamped.

3,670,688
COMPOSITE VALVE STEM
Lewis A. Seaberg, 7401 Humboldt Ave. S., Minneapolis, Minn.
Filed March 2, 1971, Ser. No. 120,121
Int. Cl. B60c *23/02*
U.S. Cl. 116—34 4 Claims

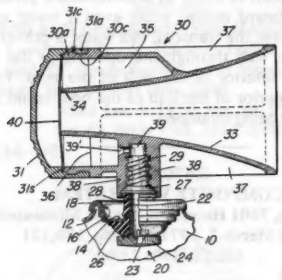


A pressure-indicating composite valve stem for mounting in the valve stem opening of tubeless tire rims is taught. The valve stem includes a central rigid tubular stem member. A

barrel housing extends about or around a portion of the length of the central tubular member, forming an elongated annular cavity about the tubular member. A lateral port in the wall of the central tubular member communicates with this cavity. The barrel housing has an annular band transparent window permitting view of pressure indicia within the barrel housing. A significant portion of the central tubular member extends below the barrel housing and is firmly bonded to a unitary elastic body. This elastic body also is firmly bonded to the lowermost portion of the barrel housing and forms a hermetic seal over the junction at the inner or lowermost end of the barrel and the tubular member. The elastic body is also provided with a neck portion and head portion for mounting purposes in the tubeless tire rim.

Within the cavity between the barrel housing and tubular member is a pressure-indicating assembly which includes a ring piston, a coil spring forcing the piston toward the bottom of the cavity nearest the rim mounting, a sleeve-like visual pressure indicator fixed to the piston and viewable through the window of the barrel housing, movable seals for maintaining an air tight condition as the piston slides, stop member to limit the motion of the piston, and means permitting atmospheric air passage from and to the outer end of the cavity as the piston slides therein.

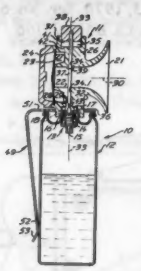
3,670,689
TILT-OPERATED HAND HELD GAS POWERED ACOUSTIC DEVICE
Michael Pappas, Irvington, N.J., assignor to Falcon Safety Products, Inc., Mountainside, N.J.
Filed March 20, 1970, Ser. No. 21,244
Int. Cl. G08b *21/00*
U.S. Cl. 116—112 **8 Claims**



A hand-held gas powered horn is operated by manually tilting the horn body with respect to the can from which it is supported. The can contains a vaporizable liquid or compressed gas which is released through a valve mounted in the neck of the can and having a stem on which the horn is mounted by a screw-thread connection. The parts are made of momentarily deformable synthetic plastic material which enables the cover to be snapped in place on the back of the horn body and the horn to be force-locked on and force-released from the valve stem.

3,670,690
AEROSOL OPERATED HORN
Robert E. Swanson, 5212 Granville St., Vancouver 13, British Columbia, Canada
Filed Nov. 9, 1970, Ser. No. 87,808
Int. Cl. G08b *21/00*
U.S. Cl. 116—112 **2 Claims**

A small air horn adapted to be secured to a standard valve of a standard aerosol cartridge. A push rod extending through the horn to the valve, with a push button at an outer end of the rod. When the push button is pressed inwards, the push rod moves inwards so opening the valve. Gas under pressure

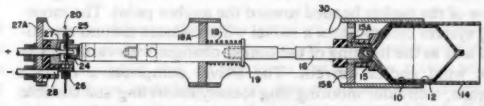


passes to the horn causing it to sound. This is a small device — well adapted for use as a personal warning and signalling device.

3,670,691
BOOKMARKS
Isabel H. Anderson, 3427 E. Hatcher Road, Phoenix, Ariz.
Filed April 10, 1970, Ser. No. 27,367
Int. Cl. B42d *9/00*
U.S. Cl. 116—119 **3 Claims**

A bookmark employing a bifurcated elongated member for extending around one or more pages of a book and having an ornamental crown fastened to the member for indicating the type of book on which the bookmark is placed. A ribbon is pivotally mounted on the bookmark between the bifurcated elongated member and the crown for 360° pivoted movement.

3,670,692
UNDERWATER DYE-MARKER RELEASE MECHANISM
David L. Jackson, 4504 Cape May Ave., San Diego, Calif.
Filed May 12, 1970, Ser. No. 36,520
Int. Cl. G09f *9/00*
U.S. Cl. 116—124 B **3 Claims**

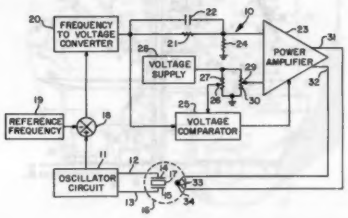


A quantity of concentrated marker dyestuff is sealed between two lip-to-lip plastic cups. The cups are held together in a round tubular sleeve by a strong pre-loaded spring in response to a remote trigger pulse, whereupon the cups fall apart and release the dye.

3,670,693
QUARTZ CRYSTAL RESONATOR TUNING CONTROL APPARATUS

William G. Rorick, Costa Mesa, and Herbert O. Lewis, Westminster, both of Calif., assignors to Collins Radio Company, Dallas, Tex.

Filed March 23, 1971, Ser. No. 127,270
Int. Cl. C23c 11/12
U.S. Cl. 118—5 6 Claims

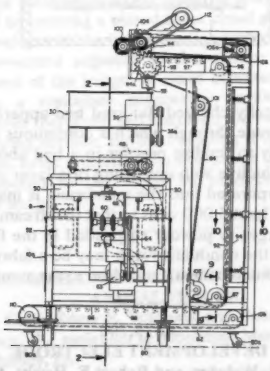


A quartz crystal resonator tuning plating automatic control process utilizing an automatic feedback control circuit in a process loop with the quartz crystal being metal plating tuned in an oscillator circuit. The frequency of the oscillator circuit is mixed with a reference frequency and the difference frequency is converted to dc applied to an RC circuit connected to a power amplifier for developing an exponential power output response from the power amplifier that melts and vaporizes plating metal (such as gold) in a vacuum chamber. This results in the plating rate on the quartz crystal being tuned processed tapering off from a much higher rate to a very low plating rate as the desired tuned frequency is approached. Minimum power level and shutoff controls are provided for the power amplifier in attaining desired levels of product frequency adjustment and plating cutoff.

3,670,694
APPARATUS FOR COATING FOOD ARTICLES

Leo G. Vogel, Downingtown, Pa., assignor to Campbell Soup Company, Camden, N.J.

Filed Sept. 15, 1969, Ser. No. 857,675
Int. Cl. B05b 7/14; B05c 5/00
U.S. Cl. 118—24 5 Claims

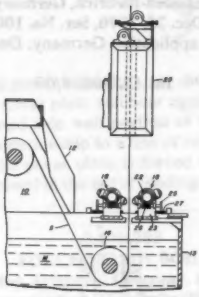


An apparatus for applying moist, long strands of shredded coconut or similar material to a series of food articles, such as layer cakes, in which the coconut is sprayed onto and around the cakes by rotating impellers as the cakes advance through a chamber. The coconut not adhering to the cakes is collected at the bottom of the chamber by air under pressure and recirculated to the impellers by a conveyor system. A rotating agitator located within a reservoir continually breaks up lumps of the shredded coconut and laterally moving cups carry and crop the coconut to the impellers for application to the food articles.

3,670,695
APPARATUS FOR CONTROLLING WEIGHT AND DISTRIBUTION OF A COATING

Robert W. Patterson, Fairfield, Ala., assignor to United States Steel Corporation

Filed Feb. 23, 1971, Ser. No. 117,894
Int. Cl. B05c 11/06
U.S. Cl. 118—63 3 Claims

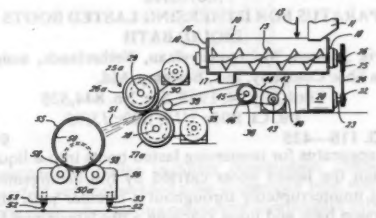


An air knife assembly with a multiplicity of curved orifices spaced around its periphery for controlling the weight and distribution of a coating applied to a continuously moving substrate. Means are included for rotating the assembly to position any desired orifice into an operating position facing the substrate. Removable baffles prevent the flow of air to all of the knives except the one in the operating position.

3,670,696
COATING APPARATUS FOR TUBULAR OBJECTS

Anthony W. Findley, Bellechasse, La., and Jesse M. Rogers, Houston, Tex., assignors to Anchor-Wate Company

Filed Feb. 22, 1971, Ser. No. 117,607
Int. Cl. B05c 5/00; B05b 13/02
U.S. Cl. 118—320 10 Claims



A pair of elastomeric coated drums is arranged so that the longitudinal axis of the lower of the pair of drums is positioned rearwardly, or offset from, the longitudinal axis of the upper of the pair of drums to thereby provide a receiving area on the lower drum for receiving a mixture of aggregate, cement, and water. One of the drums of the pair is mounted so that it may be moved along its support toward and away from the longitudinal axis of the other drum, and it may be adjusted to any desired position, up and down, in spaced relation to the other drum. As the drums are rotated, the mixture deposited on the

lower drum will be conveyed between the drums and impelled onto the surface of a tubular member. The angle or direction of the stream discharged from between the drums may be changed by moving and positioning one of the drums relative to the other drum. The desired angle of discharge of the stream depends upon the diameter of the tubular member being coated. The drums are elastomeric coated to provide a more uniform surface for contacting and impelling the mixture from between the drums in a more uniform stream, and the elastomeric coating is wear resistant.

3,670,697

APPARATUS FOR COATING A TUBE OF FIBER MATERIAL WITH VISCOSE BY EXTRUSION

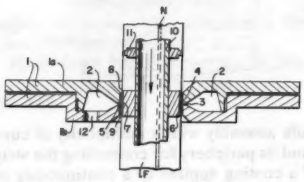
Erwin Kindl, Wiesbaden-Biebrich, and Ernst Riegler, Niederwalluf, both of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Dec. 23, 1970, Ser. No. 100,917

Claims priority, application Germany, Dec. 27, 1969, P 19 65 129.7

Int. Cl. B05c *3/00*

U.S. Cl. 118—408 **5 Claims**



This invention relates to an apparatus for coating a tube of fiber material with viscose, comprising an annular slot die and a backing element spaced therefrom to form a cylindrical passage having a width of 0.3 to 1.0 mm through which the tube can be passed, the slot in the die being directed transversely with respect to this passage and having its exit into this passage at a distance of at least 2 mm from the tube entry of this passage and of at least 2 mm and at least three times the width of said passage from the tube exit of this passage.

3,670,698

APPARATUS FOR IMMERSING LASTED BOOTS IN A LIQUID BATH

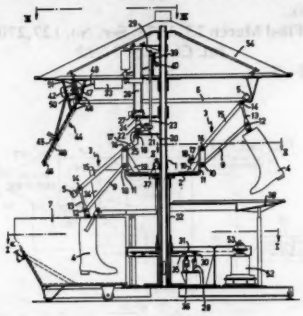
Hendrik Joosten, Montgomerylaan, Netherlands, assignor to Bata Shoe Company, Inc., Belcamp, Md.

Filed July 24, 1969, Ser. No. 844,535

Int. Cl. B05c *3/10;* **B29c** *13/00*

U.S. Cl. 118—425 **9 Claims**

An apparatus for immersing lasted boots into a liquid bath in which the lasted boots carried by rod arrangements are moved uninterruptedly throughout a circular path above an immersion bath and upon reaching a predetermined location in the path each rod arrangement moves downwardly for immersing the lasted boot in an immersion bath after which the lasted boot is moved upwardly to the circular path for the completion of its travel therealong. Movement means are provided for supporting the rod arrangement during its movement into the bath, its immersion, and its return to the circular path. The rod arrangement includes a plurality of pivotally interconnected rods defining a polygon and each polygon is mounted for movement in a vertical plane with the mutual position of the last and the rod pivots being such that during downward and upward movement of the rod arrangement, the lasted boot is in a position inclined to the perpendicular and in a vertical position during immersion and means attached to one of



the rods constituting each polygon bears against a rotatable disc which is a pat of the movement means.

3,670,699

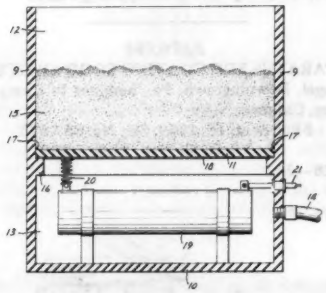
ELECTROSTATICALLY CHARGED FLUIDIZED BED APPARATUS

Jerald P. Sargent, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 24, 1970, Ser. No. 49,241

Int. Cl. B05b *5/02*

U.S. Cl. 118—629 **6 Claims**



Electrostatically charged fluidized bed apparatus having a porous membrane through which a continuous stream of air flows upwardly to fluidize powder in a bed above the membrane. A conductive web consisting of a layer of conductive particles incorporated into the membrane is maintained at a potential of at least 5,000 volts so that the stream of air carries electrical charges to powder suspended in the fluidized bed. Alternatively, the conductive web may be a fabric of conductive fibers mounted beneath and close to the membrane.

3,670,700

DEVELOPMENT ELECTRODE

James E. Britt, Webster, and Robert E. Hewitt, Penfield, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

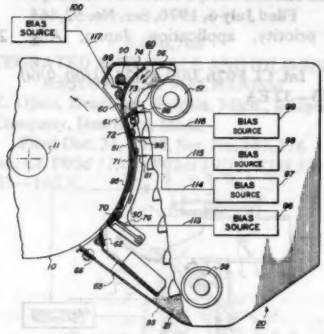
Filed July 3, 1969, Ser. No. 838,815

Int. Cl. G03g *13/00*

U.S. Cl. 118—636 **4 Claims**

A development electrode placed in a xerographic development zone in close parallel relation with a moving latent image bearing member having a potential thereon between the image

potential and background potential on the member and having means to redirect the flow of developer material moving



through this region so that the developer material impinges against the surface of the member.

3,670,701

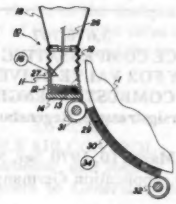
TWO STEP ORBITAL PAD DEVELOPMENT

Ernest A. Weiler, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed July 3, 1969, Ser. No. 838,952

Int. Cl. G03g *13/00*

U.S. Cl. 118—637 **10 Claims**



A method and apparatus for developing a latent electrostatic image with electroscopic material wherein development is effected by utilizing a biased toner cloud generator for conveying developer to the image bearing surface and an oscillating pad mounted adjacent to the surface to enhance the development of the image. A cloud of toner is generated by oscillating a container supporting developer to release charged toner therefrom and the cloud thereupon contacts the image bearing surface. By then orbiting a brush member on the surface, toner affixed to the non-image background areas is redistributed to the image to produce a high quality developed image.

3,670,702

HINGE MECHANISM FOR A COVER PLATE IN AN ANIMAL FEEDER

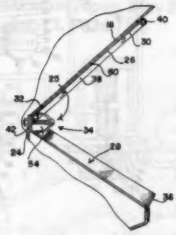
Victor W. Cory; Edgar E. Williams, and Robert J. Howard, all of Quincy, Ill., assignors to Moorman Manufacturing Company, Quincy, Ill.

Filed July 29, 1970, Ser. No. 59,120

Int. Cl. A01k *5/00*

U.S. Cl. 119—52 R **6 Claims**

The hinge mechanism includes pin formations on the cover plate and C-shaped straps which are secured to the animal feeder about the periphery thereof and which each receive the pin formations of adjacent cover plates. Each cover plate normally rests over a feeding portal in a feed trough which extends about the animal feeder. The cross section of each of the pin formations is substantially less than the opening defined between each of the C-shaped straps and the feeder to provide a sloppy fit and permit both pivotal and translational movement of the cover plate by an animal in the act of feeding so that the cover plate will be fully supported about the periphery



of its associated portal when it is not disturbed by an animal and so that the cover plate will bear against an upwardly and outwardly inclined side wall portion of the animal feeder in generally flush relationship to a line of contact on the sidewall portion when the cover plate is forced against the side wall portion by an animal in the act of feeding.

3,670,703

FORCED-FLOW BOILER

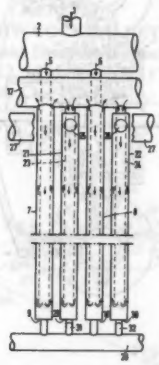
Rupprecht Michel, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Muhlheim (Ruhr), Germany

Filed July 23, 1970, Ser. No. 57,711

Claims priority, application Germany, July 26, 1970, P 19 38 043.9

Int. Cl. F22b *29/02*

U.S. Cl. 122—406 R **10 Claims**



Forced-flow boiler includes combustion chamber walls formed of vertical welded tube-crosspiece tube systems comprising riser tubes having respective downcomer tubes located therewithin.

3,670,704

BOILER CONTROL SYSTEM

Robert M. Siewert, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

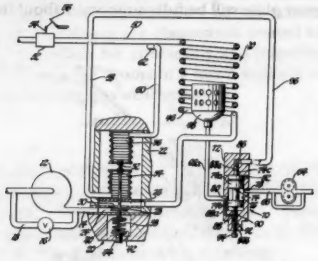
Filed Dec. 16, 1970, Ser. No. 98,622

Int. Cl. F22d *5/26*

U.S. Cl. 122—448 S **6 Claims**

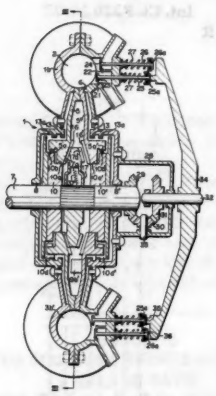
A boiler control system to control the vapor temperature and pressure at the boiler outlet of a Rankine cycle heat en-

gine utilizing a super heat control valve to throttle the liquid flow to the boiler and a boiler pressure actuated fuel control



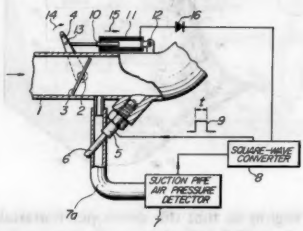
valve to regulate the flow of fuel to the burner supplying the heat input to the boiler.

3,670,705
ENGINE WITH AN ANNULAR CHAMBER
Masahiro Saito, 407 Takashi, Mobara-shi, Chiba-ken, Japan
Filed July 28, 1970, Ser. No. 58,800
Int. Cl. F02b *55/00*
U.S. Cl. 123—8.47 **7 Claims**



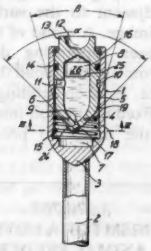
An engine comprises an annular chamber, a plurality of runners disposed in the annular chamber in a manner to be moved in the same direction by gas pressure through the annular chamber, the runners being divided into two equal groups each having at least two units, two rotor members respectively coupled with each group of runners, inertia imparting blocks attached to the respective rotor members so as to apply the momentum of the runners of one group to those of the other group by collision between the block associated with one rotor member and that coupled with the other rotor member, a power take off shaft journaled in bearings in a manner to be aligned with the rotating axis of the rotor members, two power transmitting members fixed to the power take off shaft so as to cooperate with each rotor member in the advancing direction of the runner, and means for preventing the rotor members from being moved backwards.

3,670,706
FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES
Hideya Fujisawa, Kariya, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan
Filed July 6, 1970, Ser. No. 52,465
Claims priority, application Japan, Aug. 20, 1969, 44/65906
Int. Cl. F02b *3/00*; **F02d** *31/00, 9/00*
U.S. Cl. 123—32 EA **1 Claim**



A fuel injection control system for internal combustion engines, wherein, the fuel supply is adapted to be cut during coasting only if the pressure of air in the engine suction pipe is detected to drop below a certain predetermined value and at the same time the engine throttle is detected either to be moving in the direction of decreasing the degree of opening of the throttle valve or to remain stationary, and the fuel supply is resumed to recover the acceleration of the engine when the throttle starts to move in the direction of increasing the opening of the throttle valve even during the coasting of the engine.

3,670,707
CLEARANCE COMPENSATING MECHANISM, ESPECIALLY FOR VALVE DRIVES OF INTERNAL COMBUSTION ENGINES
Jurgen Guido, Borsigstrasse 4, Regensburg-Neutraubling, Germany
Filed March 10, 1970, Ser. No. 18,090
Claims priority, application Germany, March 10, 1969, P 19 12 046.8
Int. Cl. F01l *1/14, 1/16, 1/24*
U.S. Cl. 123—90.57 **8 Claims**



A clearance compensating mechanism in reciprocating driving linkages, especially for valve drives of internal combustion engines. The mechanism is provided with a piston in front of an oil-filled pressure chamber, which piston moves into a cylinder in a downward direction, thus leaving an annular gap so as to permit a passage for minor oil leakage. The pressure chamber is in communication with a reservoir, which

also contains oil, by means of a passage having a relief valve with a valve body held by, for example, a cage and adjoining the pressure chamber below an inlet point in the annular gap. A compression spring can be provided for pretensioning the piston along the lines of its movement out of the cylinder.

3,670,708

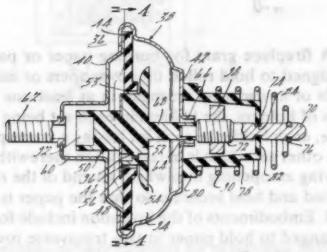
INTEGRATED ANTI-STALL AND IDLE-SPEED ADJUSTMENT MECHANISM

William K. Ojala, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 31, 1970, Ser. No. 103,216

Int. Cl. F02d *11/08*; F02m *19/12*; F16f *3/07*

U.S. Cl. 123—103 E **7 Claims**



An integrated anti-stall and idle-speed adjustment mechanism for an internal combustion engine including a dashpot means for arresting or time delaying the final closing movement of an engine throttle valve to prevent stalling of the internal combustion engine. This dashpot includes adjustment means for setting the stroke of the dashpot and for stopping the closing movement of the throttle valve to thereby set the idle speed position of the throttle and the internal combustion engine.

3,670,709

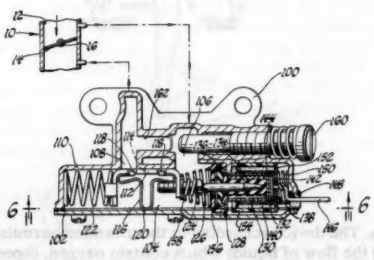
IDLE AIR CONTROL

Clarence J. Eckert, Rochester, and John W. Moulds, Penfield, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 25, 1970, Ser. No. 40,894

Int. Cl. F02m *23/04*

U.S. Cl. 123—124 R **1 Claim**



Idle air flow is bypassed around the closed throttle in an internal combustion engine induction passage and controlled by poppet and slide valve embodiments of an idle air control valve to regulate engine idle speed. The valve are positioned by a power element which is electrically heated to a predetermined temperature during the engine warmup period.

3,670,710

APPARATUS AND METHODS FOR CONTROLLING THE AMOUNT OF FUEL INJECTED INTO AN INTERNAL COMBUSTION ENGINE

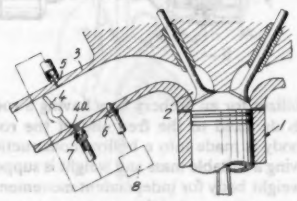
Tasuku Date, Tokyo, and Eiichi Hashimoto, Niiza-machi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1970, Ser. No. 86,192

Claims priority, application Japan, May 21, 1970, 45/42903

Int. Cl. F02d *1/06*

U.S. Cl. 123—140 MP **7 Claims**



The amount of fuel injected into an inlet passage of an internal combustion engine leading to a cylinder thereof is regulated by a control device in response to suction pressure in the passage and to the degree of opening of a throttle valve in the passage. This is achieved by connecting in parallel to the control device, a first suction opening in the passage downstream of the valve, and a second suction passage immediately proximate the valve so as to lie downstream thereof when the valve is closed but to gradually be positioned upstream of the valve as it opens.

3,670,711

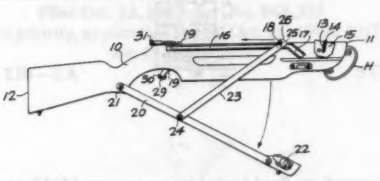
CROSSBOW COCKING DEVICE

Max Firestone, 26151 Lake Shore Blvd., Euclid, Ohio

Filed Feb. 22, 1971, Ser. No. 117,228

Int. Cl. F41b *5/00*

U.S. Cl. 124—25 **5 Claims**



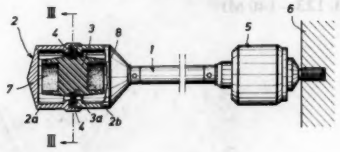
A crossbow with a crossbow cocking device for cocking a bow string in which the cocking device includes a lever and link mechanism for moving the bow string to cocked position preparatory to shooting an arrow aligned on the stock of the crossbow, the lever being pivoted at one end to the stock of the crossbow and the link being pivoted at one end to the lever and having means at its other end for engaging the bow string. The lever when pivoted rearwardly may selectively engage and pivot the trigger and release the bowstring into engagement with the means on the other end of the link so that, if desired, the bowstring can be moved from a cocked position to an untensioned position without firing of an arrow.

3,670,712

STABILIZER FOR ARCHERY BOW

Tadao Izuta, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Feb. 17, 1971, Ser. No. 116,082
Claims priority, application Japan, Feb. 21, 1970, 45/16721
Int. Cl. F41b *5/00*
U.S. Cl. 124—30 R 4 Claims



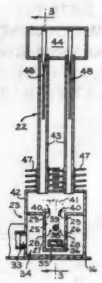
A stabilizer for an archery bow having a rod portion and a weight body fixed to the free end of the rod portion. The weight body is made into a hollow construction and a mass-body having a suitable mass and weight is supported within the hollow weight body for independent movement by means of a resilient mounting material in such a manner that the mass-body can be vibrated inside of the hollow weight body substantially in all directions.

3,670,713

GAS-FIRED HEATER MEANS

Roy W. Abbott, Jeffersontown, Ky., assignor to General Electric Company

Filed June 18, 1970, Ser. No. 47,433
Int. Cl. F24h *3/06*
U.S. Cl. 126—110 R 6 Claims



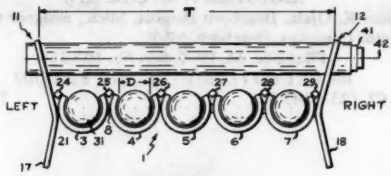
Improved gas-fired heater means are provided for supplying heat to a space, such as a room, house, building, or the like. Basically, the improved heater means comprises a combination of highly efficient heat exhanger means for transferring heat generated by the combustion of a combustible gas-air mixture to air circulated between the heat exchanger means and the space to be heated at a rate of at least 3,500 BTU of heat per hour per pound of heat exchanger means material and high intensity combustor means for mixing fuel-gas with pressurized air to produce the combustible gas-air mixture and to burn that mixture to provide a source of heat of sufficient intensity to meet the heat transferring ability of the highly efficient heat exchanger means. The improved heater means provided by the present invention permits considerable weight and volume reduction and consequent cost savings in heat exchanger means material over conventional gas-fired heaters of comparable heating capacity.

3,670,714

FIREPLACE GRATE

Leonard Eyges, Observatory House, Wellesley College, Wellesley, Mass.

Filed Jan. 26, 1971, Ser. No. 109,926
Int. Cl. F23h *13/02*
U.S. Cl. 126—165 10 Claims



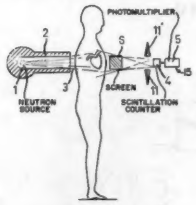
A fireplace grate for burning paper or paper and wood is designed to hold rolled up newspapers or magazines with the rolls of newspapers arranged in at least one row and held by sets of holders, the holders in each set being arranged side by side, each holder in each set having a corresponding holder in the other set which is in registration therewith and each holder having an opening into which an end of the roll of paper is inserted and held securely so that the paper is not likely to unroll. Embodiments of the invention include four sets of holders arranged to hold paper in two transverse rows one above the other with sufficient space between the rows and between rolls of paper in a row to permit ample flow of air between to sustain burning of the rolls.

3,670,715

DEVICE FOR MEASURING THE FLOW OF BLOOD

Jean Robert Perilhou, Bourg-La-Reine, and Michel Joseph Auphan, Courbevoie, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,519
Claims priority, application France, Feb. 12, 1969, 6903308
Int. Cl. A61b *5/02*; G01t *1/20*
U.S. Cl. 128—2.05 V 5 Claims



a. The device according to the invention permits of measuring the flow of liquids which contain oxygen, especially blood flow.

b. It comprises a pulsed neutron source which partly irradiates the liquid; the oxygen O^{16} of the liquid is converted into N^{16} which emits radiation.

A detector measures the radioactivity of the liquid as a function of flow.

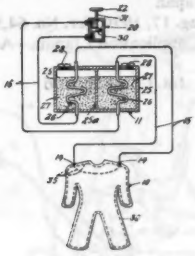
c. The device can be used especially in medical diagnosis for measuring blood flow, for example cardiac output, arterial flow or the supply of blood to an organ.

3,670,716

SELF-HEATED PROTECTIVE GARMENT

John J. Esposito, Delran, N.J., assignor to the United States of America as represented by the Secretary of the Navy

Filed Dec. 21, 1970, Ser. No. 100,073
Int. Cl. B63c *11/28*; F24j *1/00*
U.S. Cl. 126—204 7 Claims



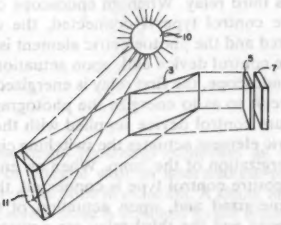
A heat-augmentable outside garment for protecting personnel from extended low temperature exposure. A network of flexible tubing lined within the outside garment completes a loop between the one ends of two coils within chambers of a portable heater unit containing a chemical exothermic composition. The other ends of the coils are connected respectively to an upper and a lower chamber of a portable manual double-action pump. The upper and the lower chambers of the pump, the coils, and the tubing are filled by a heat transfer fluid. Reciprocation of the pump alternates fluid flow to and from the two coils and the tubing resulting in heat transfer from the exothermic reaction of a chemical composition to the garment.

3,670,717

UNLIMITED QUANTITY OF POWER FROM SOLAR RADIATION SECURED WITH ZERO ATMOSPHERIC POLLUTION

Charles G. Abbot, 4409 Beechwood Road, Hyattsville, Md.

Filed March 24, 1971, Ser. No. 127,638
Int. Cl. F24j *3/02*
U.S. Cl. 126—270 4 Claims



Solar radiation collected by a polar siderostat is reflected by a reflecting surface arranged at an angle to the beam from the polar siderostat of one-half of the latitude of the polar siderostat. The resulting horizontally disposed beam of solar radiation is then utilized by vertically disposed elements for heating air which heated air is thereafter converted to useful work.

3,670,718

PATIENT CARE WALL

Thomas Brendgord, Fairview, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed June 1, 1970, Ser. No. 41,985
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 R 10 Claims

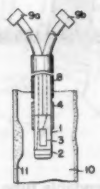
This specification discloses a wall with a window in it. The wall may be in the form of a closure for a room to prevent cross contamination between service personnel and the environment in which they work. The wall has a tent-like sheet with "built-in" suits, adapters and life support equipment that permit one or more persons to perform work with a high degree of dexterity and accessability within a sealed chamber. In a lowered position, the tent becomes a closure for the window. In the raised position, the tent permits ingress and egress of service personnel. The suits are attached to the tent by means of adapters which permit access to the full length of a reclining patient. A clear plastic helmet is attached to the suit. An air supply provides air to the helmet and to the gloves through a passage formed by two layers of the plastic. The air flow prevents fogging of the inside of the helmet and helps to keep the hands dry and comfortable.

3,670,719

CATHETER TYPE SEMICONDUCTOR RADIATION DETECTOR

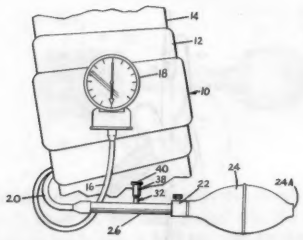
Tetsuji Kobayashi, Yokohama-shi, and Seiichi Takayanagi, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Oct. 22, 1969, Ser. No. 868,355
Claims priority, application Japan, Oct. 25, 1968, 43/77323
Int. Cl. A61b *6/00*
U.S. Cl. 128—2 A 5 Claims



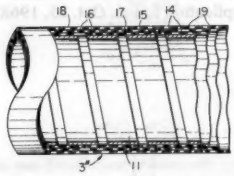
A catheter type semiconductor radiation detector for insertion into a living body includes an elongated, preferably cylindrical semiconductor radiation detector having a first detecting portion non-directionally sensitive to radiation in a direction perpendicular to the longitudinal axis of the detector and at least a second detecting portion directionally sensitive to radiation in the direction perpendicular to the longitudinal axis of the detector.

3,670,720
POWER-ASSISTED INFLATION ASSEMBLY FOR SPHYGMOMANOMETERS
Norman Panzer, 71 Blanchard Road, South Orange, N.J.
Filed May 4, 1971, Ser. No. 140,163
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 G **8 Claims**



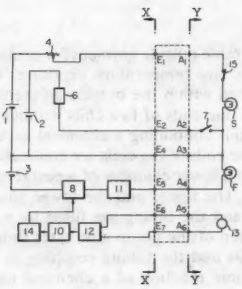
In a sphygmomanometer, the improvement which comprises a tube interconnecting the air line, leading to the inflatable cuff, and the air-introducing bulb by means of an interconnecting channel, with the channel having inner diameters at its ends at least equal to the inner diameters of its connecting elements and tapering centrally to define a constricted throat, and an air-intake tube disposed at right angles to the throat axis and affording air intercommunication between the throat and the exterior of the tube. The air-intake tube is further provided with a sleeve valve to selectively close off communication of the throat with the exterior of the tube.

3,670,721
ENDOSCOPE
Masaharu Fukami, and Toshiyuki Mori, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Feb. 5, 1970, Ser. No. 8,776
Int. Cl. A61b 1/06
U.S. Cl. 128—6 **2 Claims**



Endoscope having a bendable tube connected to a forward end member adapted to be inserted into a hollow body portion to be inspected and controlled from a control housing and an elongated flexible tube connecting the bendable tube and the control housing. The flexible tube has a thin tubular synthetic resin layer having a tubular net-like braid of non-metallic fibers embedded therein and another thin tubular synthetic resin layer having a tubular net-like braid of metallic fibers embedded therein, the superimposed resin layers coaxially covering the flexible core of the flexible tube, and the bendable tube comprises a tubular, knitted net-like braid of crimped synthetic fibers closely enveloping a bendable tubular core and a pliable resin tube closely enveloping the braid, thus providing adequate wall thickness for the flexible tube and the bendable tube while retaining sufficient flexibility and twist-resisting property.

3,670,722
ELECTRIC POWER SUPPLYING DEVICE FOR AN ENDOSCOPE
Shinya Kosaka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Aug. 17, 1970, Ser. No. 64,513
Claims priority, application Japan, Aug. 18, 1969, 44/65234
Int. Cl. A61b 1/06
U.S. Cl. 128—6 **8 Claims**

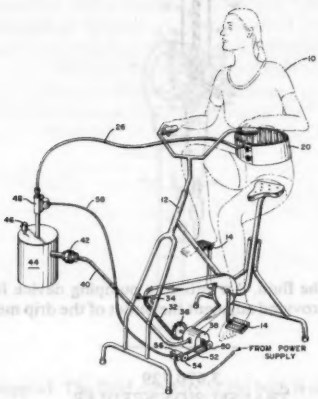


Electric power supplying device for an endoscope having a photographing device, a lamp for illuminating an object for observation and a lamp for illuminating the object for photographing. The device is adoptable to an automatic exposure control type having a photoelectric element and an endoscope of the manual exposure control type. The electric power supplying device has an exposure control device, a first, a second and a third relay. When an endoscope of the automatic exposure control type is connected, the observation lamp is energized and the photoelectric element is connected to the exposure control device and, upon actuation of release means of the endoscope, the first relay is energized to actuate a switching circuit so as to energize the photographing lamp and the exposure control device supplied with the output of the photoelectric element actuates the switching circuit to terminate the energization of the lamp. When an endoscope of the manual exposure control type is connected, the observation lamp is energized and, upon actuation of the release means, the second and the third relay are actuated so as to connect an electric source of adjustable voltage to the exposure control device so that a reference voltage manually set in the source is supplied to the exposure control device while the first relay is actuated by the third relay to actuate the switching circuit so as to energize the photographing lamp which is deenergized after a time period corresponding to the reference voltage by the actuation of the switching circuit controlled by the exposure control circuit.

3,670,723
MASSAGING DEVICE DRIVEN BY EXERCISE APPARATUS

Luther G. Simjian, 7 Laurel Lane, Greenwich, Conn.

Filed Oct. 8, 1970, Ser. No. 79,113
Int. Cl. A61h 7/00
U.S. Cl. 128—64 10 Claims

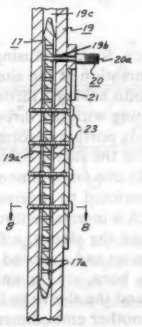


An inflatable massaging device, such as a belt, is cyclically inflated and deflated in coordinated action with the operation of an exercise apparatus requiring the expenditure of muscle power.

3,670,724
PROSTHETIC OR FRACTURE DEVICE AND METHOD

David N. Bosacco, 266 Saxer Ave., Springfield, Pa.

Filed March 12, 1970, Ser. No. 19,002
Int. Cl. A61f 5/04
U.S. Cl. 128—92 D 5 Claims



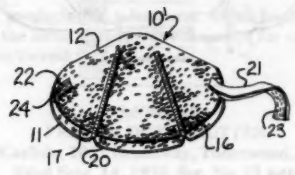
A hip replacement prosthesis comprises an artificial ball mounted on or integral with an intermediate portion which abuts the end of the bone in question. A shank or stem having a plurality of screw holes is attached to the intermediate portion and is intended for intramedullary insertion. The intermediate portion has at least one locating hole and the stem has a plurality of spaced holes formed therein. The stem is inserted into the medulla leaving the locating holes in the intermediate portion exposed. A rectangular post is fitted into the locating holes and then a template having a rectangular aperture is fitted over the rectangular post. The template has a plurality of screw holes in it positioned, when in place, to be congruent with the holes in the stem. When the template is in place one or more holes are drilled transversely through the template, the near bone cortex, the corresponding prosthetic stem hole and the far cortex portion. The template is then removed and screws are then screwed through the aligned holes in the bone and the stem.

In ordinary bone fixation a similar technique is used except that at least part of the external plate or template is left on and the screws are screwed through it, the bone and the intramedullary nail.

3,670,725
PROTECTIVE PAD

John F. Gaylord, Jr., Charlotte, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.

Filed June 30, 1969, Ser. No. 837,548
Int. Cl. A61b 19/00
U.S. Cl. 128—149 3 Claims

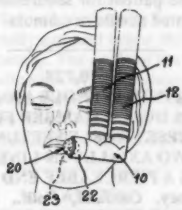


A protective pad for an elbow, heel, knee or like body portion including a generally convexo-concave member of cushioning material having a pair of spaced apart seams extending inwardly from the outer periphery of said member but terminating in spaced apart inner ends, said seams joining together cut edges of said material formed by the removal of two sectors from the material and serving to impart to said member its generally convexo-concave shape, and fastener means carried by said member for securing the pad on the body of a wearer in covering relation to the body portion to be protected.

3,670,726
BREATHING CIRCUIT

Thomas J. Mahon, Palisades Park, and Samuel Cherba, Totowa, both of N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Sept. 23, 1969, Ser. No. 860,319
Int. Cl. A61m 17/00
U.S. Cl. 128—188 5 Claims



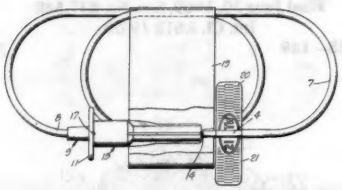
There is disclosed a breathing circuit which includes a swivelled fitting for connection to a patient's face mask or endotracheal tube and for connecting thereto breathing hoses which are to be connected to an anesthetic machine or to a pulmonary ventilator. The fitting is characterized in that the hoses are laterally disposed with respect to the patient's nose. The circuit in its entirety is further characterized in that it is light in weight, is translucent and is designed for one-patient use to render it disposable.

3,670,727

MEDICAL INFUSION SET

Donald R. Reiterman, Sierra Madre, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed April 16, 1970, Ser. No. 29,039
Int. Cl. A61m 05/00, 05/32
U.S. Cl. 128—214 R 11 Claims



A medical infusion set for administering parenteral liquid into a patient's veins in which the set is in the form of a continuous flexible loop that is manually broken apart before venipuncture at a frangible section (this section comprising an indication of the sterile integrity of the set to subsequent users), the set providing means for flushing air therefrom while maintaining the set in a sterile condition by either running the liquid through the loop before effecting the venipuncture, or flushing the air from the set by using the patient's blood flowing therethrough and before connection to the liquid being administered; the set including means protecting either a connector to the parenteral liquid or the needle against contamination while air is flushed from the set; and the needle of the set including a pair of flexible plastic wings generally diametrically opposed and including manually interengageable portions comprising interengageable upstanding ribs manually interlockable when manually pinched together to form a dual purpose temporary handle in which the wings can be subsequently spread apart adjacent the venipuncture in the patient for securement to the patient to stabilize the implanted needle or cannula.

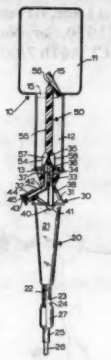
3,670,728

APPARATUS FOR INTRAVENOUS ADMINISTRATION OF A FLUID FROM A DUAL-CHAMBER FLASK HAVING AN INTERNAL UPSET-TABLE SEPTUM NORMALLY SEPARATING TWO AXIALLY-IN-LINE CHAMBERS AND HAVING A PIERCEABLE END STOPPER

William C. Dabney, Oakland, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed June 1, 1970, Ser. No. 41,866
Int. Cl. A61m 05/16
U.S. Cl. 128—214 C 7 Claims

A standard drip meter assembly of the type having an upstanding stopper piercer with both an air inlet and a passage for the fluid into the drip meter, is supplemented by a solid air-inletting spike with a socket fitting over the stopper piercer and having a long shank that terminates in a non-coring piercing end. Passages adjacent the socket communicate with the air inlet and the passage in the drip meter stopper piercer. The supplemental spike is long enough to upset the septum after it pierces the stopper of a dual-chamber flask. An advantage is that inletting air then enters near the bottom of the flask to help agitate the fluid. An initiating pumping device for hand operation is provided adjacent the outlet of the drip meter.

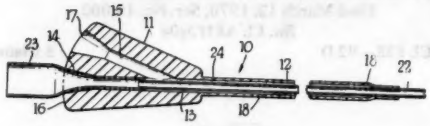


3,670,729

TRANSFUSION NEEDLES

Alan E. C. Bennett, 40, White Horse Drive, Epsom, Surrey, and Michael Bewick, 12, Grenville Place, London, S.W.1., both of England

Filed Sept. 17, 1969, Ser. No. 858,593
Claims priority, application Great Britain, Sept. 19, 1968, 44,530/68; May 19, 1969, 25,421/68
Int. Cl. A61m 05/00
U.S. Cl. 128—214.4 8 Claims



A transfusion device for transfusing fluid intravenously without causing inflammation at the site of entry. The device comprises a body portion having a through bore and a secondary bore communicating with the through bore and a sleeve projecting from the body portion to form a continuation of the through bore, the wall of the sleeve being provided with a plurality of perforations. In one embodiment of the invention, the tip of the sleeve is restricted to receive and seal against the tube of a catheter which is insertable through the through bore in the body portion and the sleeve, a first fluid being transfused through the catheter and a second fluid being transfused through the secondary bore, via the annular passage formed between the catheter and the sleeve to the perforations in the wall of the sleeve. In another embodiment of the invention, an integral inner wall is provided within the sleeve, the inner wall being imperforate and forming a continuation of the through bore which serves as a flow passage for the first fluid.

3,670,730

LIQUID MEDICINE APPLICATOR

Norman S. White, Pittsburgh, Pa., assignor to The Sampson Corporation

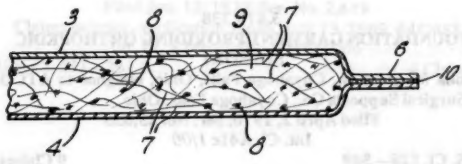
Filed March 12, 1971, Ser. No. 123,659
Int. Cl. A61j 7/00
U.S. Cl. 128—222 7 Claims

A one-piece syringe formed entirely of plastic has a dosage scaled barrel provided at one end with a discharge nozzle and

at the other end with a flexible, resilient, hand-compressible bulb in which its major wall portion is of less thickness than the barrel wall thickness. The bulb wall includes oppositely located finger grip areas of less thickness than the thickness of the bulb wall, whereby the finger grip areas may be indented toward each other by pinching between the thumb and forefinger of a person holding the syringe in one hand, without

other support. The fluid capacity of the bulb is such that, when the finger grip areas are indented to a point at which they cannot be further depressed without beginning to collapse the major portion of the bulb, they will have displaced from the bulb a volume of fluid sufficient to discharge from the barrel an accurately measured quantity of any liquid contained therein and without collapse of the main body of the bulb itself.

3,670,731
ABSORBENT PRODUCT CONTAINING A HYDROCOLLOIDAL COMPOSITION
Carlyle Harmon, Scotch Plains, N.J., assignor to Johnson & Johnson
Filed May 20, 1966, Ser. No. 551,772
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **11 Claims**



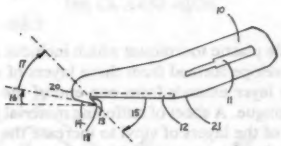
An absorbent dressing having an absorbent layer defined by water soluble hydrocolloidal composition capable of absorbing of at least about fifteen times its weight of body exudate and retaining said exudate under pressure of up to about 2.5 p.s.i.

3,670,732
VACUUM CURETTE
Ralph R. Robinson, P. O. Box 668, Middlesboro, Ky.
Filed May 11, 1970, Ser. No. 36,049
Int. Cl. A61m *1/00*; A61b *17/22*
U.S. Cl. 128—297 **5 Claims**

A curette for emptying a gravid uterus of the products of the first trimester of pregnancy has a suction tube reciprocably and rotatably carried within an open-ended sleeve and a pair of flexible, interconnected fingers joined to one end of the tube within the sleeve. After inserting the sleeve through the cervix into the uterine canal, the fingers may be expelled from the sleeve to form a loop within the uterus by shifting the tube within the sleeve. Gentle rotation and reciprocation of the tube causes the loop to wipe against the uterine walls and

loosen the products for subsequent withdrawal through the tube when the latter is coupled with means for creating negative pressure therein.

3,670,733
PRECISE DEPTH CUTTER
Richard S. Carlisle, 1051 Broadway, Thornwood, N.Y.
Filed Sept. 14, 1970, Ser. No. 71,640
Int. Cl. A61b *17/32*; B26b *29/00*; B21k *11/00*
U.S. Cl. 128—305 **7 Claims**

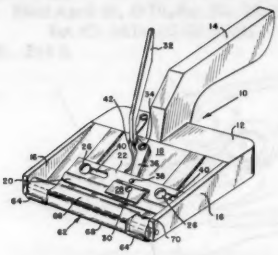


A flat member is incised at an angle of approximately 45° to a straight section of its perimeter, and a narrow portion of the body adjacent to the 45° angle is folded approximately 90° to form a guide. The remaining downwardly extending portion on the other side of the incision is sharpened to form a straight blade which can be ground to a desired length to cut soft materials precisely to exact depths. To maximize safety, a rounded portion is formed rearwardly from the blade region. The blade edge is totally exposed below the plane of the guide, to help promote accuracy. The angle of the blade edge and the slight downward inclination of the unsharpened edge extending rearwardly from the point, allow the device to initiate and sustain a prescribed depth incision with relatively slight downward pressure required on the part of the user.

3,670,734
APPARATUS FOR REMOVING SKIN SECTIONS
Thomas G. Hardy, Jr., 621 Glen Echo Trail, Winston-Salem, N.C.
Filed July 20, 1970, Ser. No. 56,343
Int. Cl. A61b *17/322*
U.S. Cl. 128—305 **1 Claim**

An apparatus for obtaining skin sections of preselected thickenesses and widths having a reciprocating blade mounted within its housing. The blade can be reciprocated either manually by a displacing member or mechanically by a motor and suitable power source. The graft thickness is determined by positioning to a selected setting a member located at the

forward portion of the housing so that more or less of the cutting edge of the blade is exposed, and the graft width is



determined by positioning selectively removable guide runners located in spaced relationships each with the other.

3,670,735

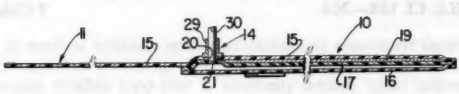
DISPOSABLE INFLATABLE TOURNIQUET

Lewis F. Hazlewood, Marlton, N.J., assignor to Walter & Kidde Company, Inc., Belleville, N.J.

Filed Feb. 9, 1970, Ser. No. 9,675

Int. Cl. A61b *17/12*

U.S. Cl. 128—327 **6 Claims**



A disposable plastic tourniquet which includes an inflatable elongated envelope formed from three layers of vinyl plastic, of which one layer extends from one end of the envelope to form a long tongue. A sheet of stiffening material is positioned between two of the layers of vinyl to increase the contact surface, and a strip of pressure sensitive tape extends from each side of the envelope to engage the tongue and lock the tourniquet in possition on the patient.

3,670,736

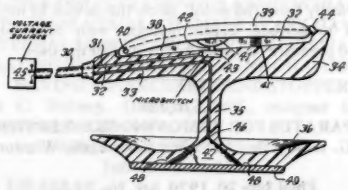
THERAPEUTIC INSTRUMENTATION ELECTRODE

Joseph J. Panico, Arlington, Mass., assignor to Health Systems, Inc., Woburn, Mass.

Filed July 17, 1970, Ser. No. 55,851

Int. Cl. A61n *1/04*

U.S. Cl. 128—404 **7 Claims**



A medical electrode for applying electrical energy to or across the body of a patient which includes a paddle having a flat disc-like contact plate electrode for intimate contact with the skin. Electrical energy is supplied to the plate along a ring disposed centrally thereof through a hollow right cone at whose apex the energy is applied. The paddle also includes an upper dielectric horizontal handle having a control switch through which a supply wire passes to and through a vertical dielectric rod to the cone apex. Disposed above the plate is a dielectric shield protector which is integral with the rod and extends outwardly past the plate.

3,670,737

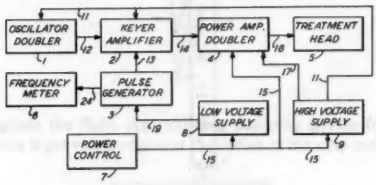
ULTRA-SHORT WAVE ATHERMAPEUTIC APPARATUS

Joseph J. Pearo, Great Neck, N.Y., assignor to Diapulse Corporation of America, New Hyde Park, N.Y.

Filed July 2, 1970, Ser. No. 51,945

Int. Cl. A61n *1/40*

U.S. Cl. 128—422 **10 Claims**



An athermapeutic apparatus for administration of electrotherapeutic treatments to living matter for curing or abatement of diseases, infections and the like, by subjecting such matter to high frequency oscillations of a preselected wavelength for predetermined time periods thereby eliminating the generation of accompanying heat generation. The desired electromagnetic oscillations are accurately produced with a minimum of power consumption by utilization of stable solid state circuitry resulting in more accurate pulse frequency generation accompanied by considerably reduced power consumption and enabling a much greater degree of control over both pulse frequency and power output administered to a patient or the like. Proper treatment dosage in terms of pulse frequency and penetration is readily selectable by depression of the proper push-button on the front of apparatus panel, with a lighted signal lamp behind the button indicating each treatment setting as selected by the operator. Moreover, with reduction in power consumption a much greater degree of control over the pulse frequency and power is achieved.

3,670,738

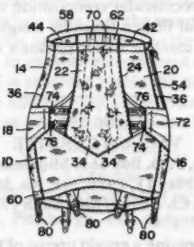
FOUNDATION GARMENT PROVIDING ORTHOPEDIC SUPPORT

Leona M. Johnson, Cuyahoga Falls, Ohio, assignor to ATCO Surgical Supports Co., Cuyahoga Falls, Ohio

Filed April 2, 1970, Ser. No. 25,035

Int. Cl. A41c *1/00*

U.S. Cl. 128—549 **9 Claims**



A foundation garment which provides support in both the abdominal and pelvic regions. The garment is in the form of a body enveloping sheath of an elastic material which has non-

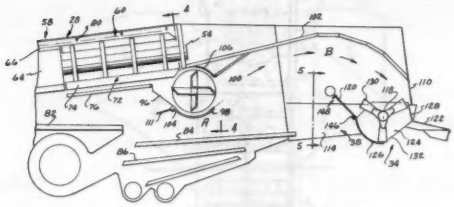
elastic panels at least at the upper portions of the front and back of the garment. A removable body-encircling elastic band is attached to tabs at the opposite sides of the upper front panel and is positioned vertically adjustably in the back by a strip of Velcro. Patches of Velcro are also provided for holding the tabs against the front of the garment when the body-encircling band is not used.

3,670,739

AXIAL FLOW COMBINE WITH A ROTARY DISCHARGE AND A STRAW CHOPPER

Edward William Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed July 14, 1971, Ser. No. 162,512
Int. Cl. A01f *7/06*
U.S. Cl. 130—27 T **9 Claims**



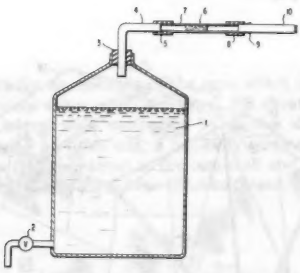
An axial flow combine has two axial flow threshing and separating units with a rotary discharge receiving discharged threshed crop material from the rear of the axial units and impelling the threshed crop material through the rear of the combine hood. A straw chopper is mounted at the rear of the hood and has a feed plate extending upwardly and forwardly within the hood for receiving and guiding crop material to the straw chopper. A transverse roll extends along the upper rear edge of the plate to clear the end of threshed crop material.

3,670,740

CIGARETTE FILTER MATERIALS

Sadao Takenaka; Soichiro Kishida, and Yoichi Yamazaki, all of Kyoto, Japan, assignors to Nippon Cloth Industry Co., Ltd., Kyoto, Japan

Filed Jan. 13, 1970, Ser. No. 2,619
Claims priority, application Japan, Jan. 13, 1969, 44/2488
Int. Cl. A24b *15/02*; **A24d** *01/06*
U.S. Cl. 131—261 R **4 Claims**



A cigarette having a filter prepared by kneading a mixture of gluten and wheat flour with water, baking the kneaded mixture, and crushing the backed product into coarse grains of less than 60 mesh.

3,670,741

METHOD OF MAKING ARTIFICIAL HAIR PIECES

Jitsuo Utsunomiya, 1416, Yanocho, Aki-gun, Hiroshima, Japan

Filed Aug. 4, 1970, Ser. No. 60,906
Int. Cl. A41g *3/00*
U.S. Cl. 132—5 **9 Claims**

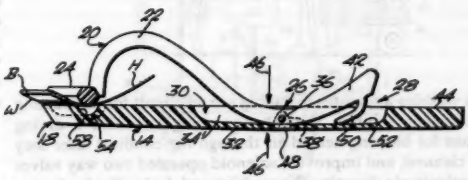
A method of making an artificial hairpiece including a layer of artificial skin with implanted hair, comprising steps of tying strands of hair to a net which is initially tensioned so as to fully open its meshes, then subsequently stretching said net in one direction whereby said net is contracted in the direction perpendicular to that of the stretching to reduce its area and thereby effect a much closer or more dense grouping of the hair strands, and applying a layer of fluid raw material to said net in its reduced area condition whereby said raw material becomes solidified forming the artificial skin with said net and hairstrands embedded therein.

3,670,742

EYELASH APPLICATOR

Edward Weaner, 7980 Hawthorne Avenue, Miami Beach, Fla.

Filed April 23, 1970, Ser. No. 31,281
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 **4 Claims**



A small hand tool for placing a false eyelash on an eyelid and for use in adhesively positioning the eyelash to the eyelid. A T-configured base element is pivotally fulcrumed to a T-configured clamp lever element. The forward portion of the base element defines a crescent shape anvil portion adapted to supportingly engage the underside of a false eyelash; the forward portion of the clamp lever element defines a crescent shape clamping portion adapted to engage the upperside of the false eyelash. Spring means continuously urge the crescent shape portions convergingly and operatively to a disposition clamping an eyelash. Subsequent to adhesively positioning a false eyelash on the eyelid, the eyelash is released by finger-squeezing the base and clamping elements thereby permitting removal of the tool from the eyelash.

3,670,743

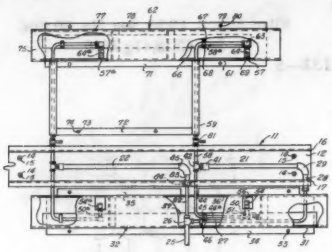
VEHICLE WHEEL WASHING APPARATUS

Werton Dewitt Moore, Dallas, Tex., assignor to Delta Manufacturing and Engineering Corporation, Dallas, Tex.

Filed Oct. 12, 1970, Ser. No. 62,058
Int. Cl. B60s *3/04*
U.S. Cl. 134—45 **7 Claims**

An apparatus for directing sprays of liquid on outer side surfaces of each pair of wheels of a vehicle as the wheels roll past

pairs of spray nozzles, the liquid being expelled under pressure through spray nozzles by flexible pump conduits which are



progressively longitudinally occluded by a vehicle wheel as it rolls over the pump conduits.

3,670,744

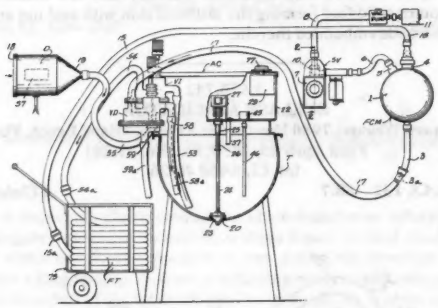
SOLENOID OPERATED, TWO WAY DIVERTER VALVE FOR FLUID LINE WASHING APPARATUS

Lloyd F. Bender, Route 5, Hayward, Wis.

Filed Jan. 11, 1971, Ser. No. 105,314

Int. Cl. B08b *3/10*, *9/02*

U.S. Cl. 134—57 R **3 Claims**



A washing apparatus including a fluid circuit for conducting a cleansing solution through conveying conduits, a drying means for blowing heated air through the conduits after they are cleaned, and improved, solenoid operated two way valves for selectively diverting the washing and drying fluids. An improved, solenoid operated, two way diverting valve for fluids.

3,670,745

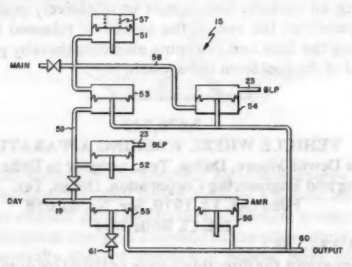
DIAPHRAGM LOGIC CONTROL CIRCUIT FOR ELECTRIC HEATING SYSTEM

Louis J. Bentsen, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed March 11, 1971, Ser. No. 123,290

Int. Cl. G05b *11/50*; G05d *16/00*

U.S. Cl. 137—84 **7 Claims**



A pneumatic, diaphragm logic circuit for controlling a step controller in a day-night, electric heat, temperature control system. The circuit establishes maximum heating when the branch line pressure of the thermostat is below a predetermined minimum, and establishes either modulated heating during the day or zero heating during the night when the branch line pressure exceeds the predetermined minimum.

3,670,746

COMBINATION DISHWASHING MACHINE AND OVEN

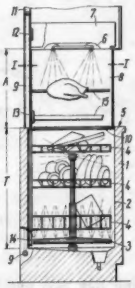
Hasso Gehrmann, Bregenz, Austria, assignor to Elektra-Bregenz GmbH, Bregenz/Vorarlberg, Austria

Filed Jan. 26, 1971, Ser. No. 109,777

Claims priority, application Austria, Jan. 26, 1970, 7767/70

Int. Cl. B08b *3/02*

U.S. Cl. 134—107 **18 Claims**



A combination dishwashing machine and oven is formed of an open-topped tank with a cover closing its opening, a heating element unit spaced vertically above the opening in the tank, and a vertically displaceable shell positionable between the cover and the heating element unit for laterally defining the oven space. A vertically arranged support column is associated with the tank and includes a lifting mechanism for displacing the shell downwardly into the tank from its position about the oven and for lifting dishwashing baskets upwardly out of the tank. The shell, tank cover and dishwashing baskets are sized so that the shell fits around the cover and baskets for effecting the vertical displacement of the various parts.

3,670,747

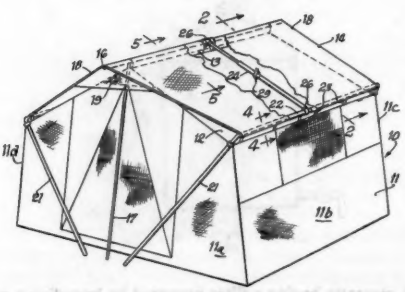
TENT WITH PERMANENTLY ATTACHED FLY

Harold J. Pohl, Washington, and Raymond H. Kratky, Kirkwood, both of Mo., assignors to Kellwood Company, St. Louis, Mo.

Filed Dec. 31, 1970, Ser. No. 103,076

Int. Cl. A45f *1/10*

U.S. Cl. 135—1 R **7 Claims**



A tent having a fly superposed over the tent roof in spaced relation thereto and permanently connected to the roof along the roof ridge. The side edges of the fly are secured to eave

frame members which support the sidewalls of the tent. The fly is maintained in taut condition and provides an air space above the tent roof for improved resistance to rain and for insulation purposes.

3,670,748

HANDLE FOR UMBRELLA

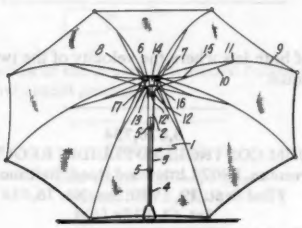
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Filed April 13, 1970, Ser. No. 27,561

Claims priority, application Germany, April 16, 1969, G 69 15 072.7

Int. Cl. A45b *25/00*

U.S. Cl. 135—20 **7 Claims**



A handle for use with an umbrella which assumes a flat rectangular cross sectional shape when collapsed wherein the handle is of a trapezoidal outline and is of flat cross section.

3,670,749

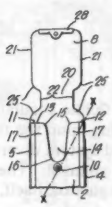
SHEATH FOR UMBRELLA

Hans Buschmann, Solingen-Ohligs, Germany, assignor to Telesco Brophy Limited, Montreal, Quebec, Canada

Filed May 13, 1970, Ser. No. 36,749

Int. Cl. A45b *25/18*

U.S. Cl. 135—33 C **3 Claims**



A sheath for an umbrella of the type which assumes a flat cross-sectional shape when collapsed, the sheath having two flat wide lateral walls connected by narrow side walls, the sheath having an open end, a cut-away portion in the front wall and a flap connected to the rear wall and overlying the cut-away portion of the front wall when closed.

3,670,750

SUN COT

Edward W. Johnston, P.O. Box 457, Schefferville, Quebec, Canada

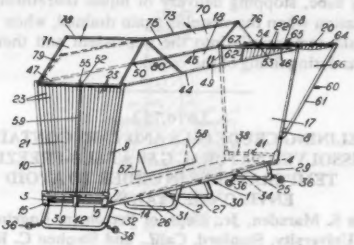
Filed Sept. 23, 1970, Ser. No. 74,600

Claims priority, application Canada, June 2, 1970, 084 435

Int. Cl. A61g *9/00, 33/06;* **A67c** *79/00*

U.S. Cl. 135—5.1 **8 Claims**

A sun cot for protecting a sun bather from the prying eyes of potential observers including a supporting bed, upstanding canvas end and side panels being provided and being supported on upstanding frame members. A zip fastener may be provided in one panel for entry of the sun bather.



3,670,751

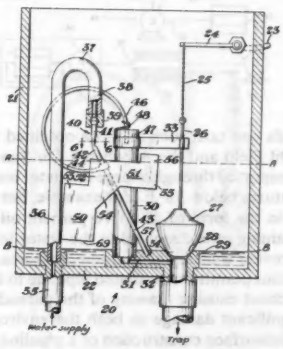
ECCENTRIC ACTING FLOATING-CONTROLLED PINCH-VALVE VESSEL FILLING ASSEMBLY

Wallace H. Buswell, Grand Haven, Mich., assignor to Clare C. Anderson, Midland, Mich., a part interest

Filed Feb. 22, 1971, Ser. No. 117,301

Int. Cl. G05d *9/02*

U.S. Cl. 137—1 **24 Claims**



An eccentric acting float-controlled pinch-valve vessel filling mechanism utilizes as flow control means, in combination, (1) a delivery tube having a free end portion and an attached end portion coupled to downwardly extending liquid supply means and an intermediate flexible portion adjacent the attached end capable of being repeatedly flexed sufficiently to shut off the flow of liquid therethrough, and (2) fixedly associated with the delivery tube adjacent the flexible portion and between such portion and the mid-length of the free end portion of the tube, a critically shaped float having substantially an L shape, being formed with two body portions that join at an angle of about 90°, such joinder being adjacent the association with the delivery tube, the free end portion of the delivery tube extending along a line between the respective longitudinal axes of the two body portions of the float and substantially in the same plane therewith. As an essential feature, the float is disposed, with respect to the delivery tube, e.g., when in an empty vessel, so that rising liquid buoys up the then depending body portion of the float and moves it slightly in a direction opposite to subsequent motion and temporarily locks it against adjacent stop means and keeps the flexible portion of the delivery tube open until the liquid level reaches the then substantially horizontal other body portion whereupon the buoyancy of this latter body portion soon abruptly moves the float out of the locked position and the buoyancy of the formerly dependent body portion is added to that of the

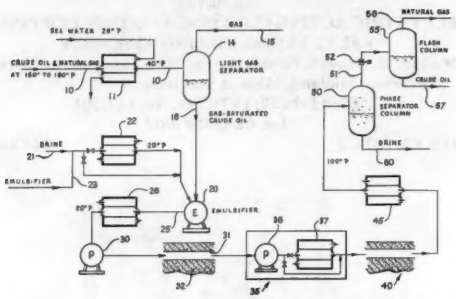
second body portion and eccentrically pivots the float and the delivery tube about the point of flexing of the delivery tube and thereby abruptly pinches shut the passageway in the delivery tube, stopping delivery of liquid therethrough until the occasion when the vessel is again drained, when the float again falls temporarily into the dependent and then locked positions during filling of the vessel.

3,670,752

PIPELINING CRUDE OILS AND TARS CONTAINING DISSOLVED NATURAL GAS AT SUB-FREEZING TEMPERATURES IN ORDER TO AVOID ENVIRONMENTAL DAMAGE

Sullivan S. Marsden, Jr., Dept. of Petroleum Engring., Stanford University, Stanford, Calif., and Stephen C. Rose, 600 Liddon Court, Midland, Tex.

Filed Feb. 26, 1971, Ser. No. 119,312
Int. Cl. F17d *1/16*
U.S. Cl. 137—13 **6 Claims**



Crude oils and tars, such as those obtained from the Prudhoe Bay Oil Field and the Athabasca Tar Sands, can be efficiently transported through a large diameter insulated pipeline at temperatures below 32° F., for example, between about 15° to 30° F., in the form of 40 to 70 percent oil-in-brine emulsions containing salts dissolved in the water in amounts sufficient to prevent freezing at said temperatures. These operating conditions permit the insulated pipeline to be buried in the ground without causing thawing of the permafrost which will lead to significant damage to both the environment and the pipeline. Subsurface construction of a pipeline of this sort has considerable economic advantage over the above-ground, supported construction required for a heated oil pipeline to avoid environmental damage. Dissolution of gas in the crude oil at these low temperatures, thus allowing transport of the gas in the same pipeline, will also add considerable economic advantage. Even at these low temperatures, the emulsion has an effective viscosity comparable to that of the oil alone at much higher temperatures so that energy consumption for pumping is at an acceptable level. On arriving at the discharge terminal, the cold emulsion can then be broken down into its constituents by heating the same either with or without the addition of demulsifying chemicals.

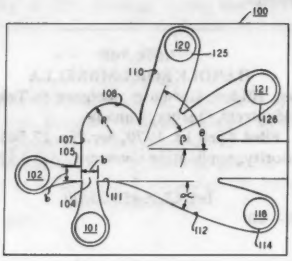
3,670,753

MULTIPLE OUTPUT FLUIDIC GATE

Anthony John Healey, State College, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed July 6, 1970, Ser. No. 52,440
Int. Cl. F15c *1/14*
U.S. Cl. 137—81.5 **9 Claims**

A fluidic device is disclosed having two input jets arranged to interact, selectively producing one of three possible outputs. A first output is produced by the presence of either of the jets in the absence of the other jet. A second output is produced by the simultaneous presence of both jets where the velocity of the first jet substantially exceeds the velocity of the second jet. The third output is produced by the simultaneous presence of both jets where the velocity of the two jets is substantially equal.

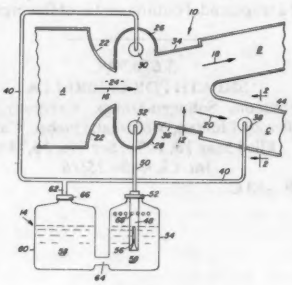


3,670,754

VACUUM CONTROLLED FLUIDIC REGULATOR

Peter A. Freeman, 8807 Littlewood Road, Baltimore, Md.

Filed Sept. 29, 1970, Ser. No. 76,414
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 **9 Claims**



Flow diversion in a fluidic regulator is controlled without moving parts. Depending upon the fluid level in a first channel, a vacuum operated system diverts a portion of incoming flow into a second channel. The operating vacuum is generated within the regulator, itself, so that regulator operation is self-contained.

3,670,755

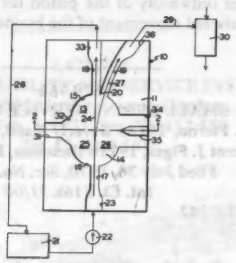
FLUID FLOW CONTROL DEVICE

Giancarlo Nardi, Pisa, Italy, assignor to Compagnia Italiana Westinghouse Freni E Segnali, Torino, Italy

Filed Sept. 17, 1969, Ser. No. 858,651
Claims priority, application Italy, Dec. 6, 1968, 54202 A/68
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 **2 Claims**

A fluid flow control device in which a housing is provided with a flat chamber having two parallel sides, a supply passage communicating with one end of the chamber and dimensioned to pass between the parallel sides of the chamber a stream of fluid in a substantially laminar flow condition to an aligned output passage on the opposite chamber end, the stream contacting the two flat sides to form a fluid diaphragm and dividing the chamber into two lateral chambers, each communicating with different control pressure passages for pressuring the two lateral chambers at different static pressure levels to provide a differential pressure gradient acting on the full free

length of the fluid stream across the chamber, bending the stream an amount determined by the pressure gradient to



deliver a portion of the stream to a second output passage adjacent the first output passage.

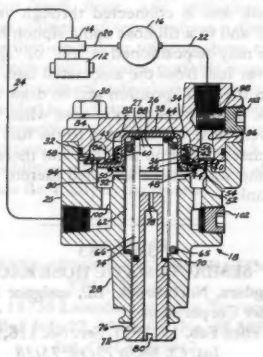
ERRATUM

For Class 137—84 see:
Patent No. 3,670,745

3,670,756
COMPRESSOR GOVERNOR

Forrest O. E. Schultz, Owosso, Mich., assignor to Midland-Ross Corporation, Toledo, Ohio

Filed May 8, 1970, Ser. No. 35,620
Int. Cl. G05d *7/00*
U.S. Cl. 137—102 **13 Claims**



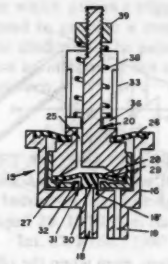
A compressor governor having a variable orifice means associated with a valve means which causes positive and instantaneous response from the pumping mode to the unloaded mode and from the unloaded mode to the pumping mode. Means is also provided to limit the adjustment in both directions to avert injury of the governor components and malfunction of the device that might otherwise result.

3,670,757
CONTROL REGULATOR

Wilbur C. Quain, Winona, Minn., assignor to Lake Center Industries, Winona, Minn.

Filed Oct. 15, 1969, Ser. No. 866,671
Int. Cl. G05d *7/00*
U.S. Cl. 137—103 **5 Claims**

A regulator to control devices and appliances which is actuated by pressure differentials coming from the source of pressure such as a vacuum source and also by feedback pressure

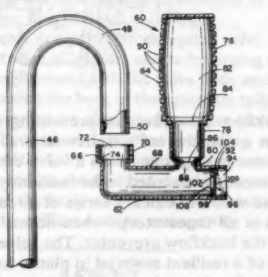


differentials from the device being controlled to provide self-monitoring servo type control.

3,670,758
PRIMING DEVICE FOR A SIPHON

Allan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, Maywood, N.J.

Filed March 30, 1970, Ser. No. 23,930
Int. Cl. F04f *10/00*
U.S. Cl. 137—150 **8 Claims**



A priming device having tube adapted for attachment to a siphon which transfers a liquid from a receptacle. A hollow, squeezible, bulb-like member extends outwardly from the tube with the space within the bulb-like member communicating with the space within the tube. The discharge end of the tube has a one-way valve which permits air to escape therefrom, but prohibits air from entering the tube through the discharge end. Squeezing the bulb-like member starts a siphoning action.

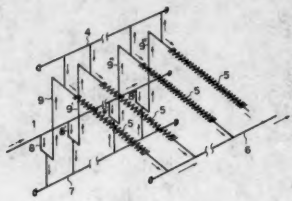
3,670,759
METHOD AND MULTI-BRANCHED NETWORK SYSTEM FOR UNIFORMLY DISTRIBUTING THE FLOW OF MIXED PHASE FLUIDS

Toru Terashima, Kawasaki, Japan, assignor to Nippon Petroleum Refining Company, Tokyo, Japan

Filed Aug. 3, 1970, Ser. No. 67,672
Int. Cl. F16k *45/00*
U.S. Cl. 137—171 **5 Claims**

A multi-branched conduit system, supplied with a mixed-phase fluid, may have its distribution network controlled with respect to the uniformity of the liquid and gaseous fluids therein by employing an upper gas conduit and, optionally, a lower liquid conduit, so that the mixed-phase fluid introduced

in the main header positioned between said upper and lower conduits deliver a uniformly mixed flow to each of the



branches of the system, even when the ratio of liquid to gas or vapor is in the main header.

3,670,760

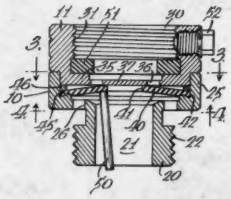
BACKFLOW PREVENTER

James Butcher, Oreana, Ill.; Richard G. Gyllstrom, St. Cloud, Minn., and William Doyle Lamb, Decatur, Ill., assignors to A. W. Cash Valve Manufacturing Corporation

Filed Aug. 13, 1970, Ser. No. 63,560

Int. Cl. F16k *45/00*

U.S. Cl. 137—218 **8 Claims**



A backflow preventer for preventing reverse water flow having as a part thereof a transverse wall between inlet and outlet water passages and with a valve disc in the form of an annular member mounted to be resiliently urged against said transverse wall and block a series of circularly disposed flow passages at all times except when normal water flow occurs through the backflow preventer. The valve disc is simply constructed of a resilient material in planar form and is mounted to be dished and urged against said transverse wall for seating engagement therewith.

3,670,761

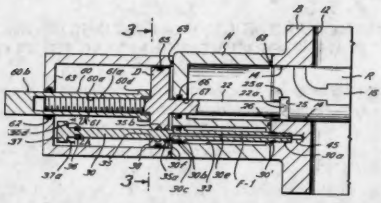
BLOWOUT PREVENTER WITH RESISTANCE MEANS BETWEEN THE BODY AND THE PISTON

Robert K. Lerouax, Houston, Tex., assignor to Hydril Company

Filed Oct. 13, 1970, Ser. No. 80,294

Int. Cl. E21b *33/06*

U.S. Cl. 137—315 **16 Claims**



Blowout preventers each having at least one movable bonnet and an operating cylinder therewith which are movable together relative to a piston in the cylinder for exposing a ram mounted inwardly of the bonnet to effect the removal of the ram, wherein the preventer has detent or resistance means between the piston and an extension of the body to resist movement of the piston, the piston rod, and the ram connected therewith when fluid pressure is applied in the operating cylinder outwardly of the piston for thereby effecting an opening outward movement of the bonnet to the ram-exposed position.

3,670,762

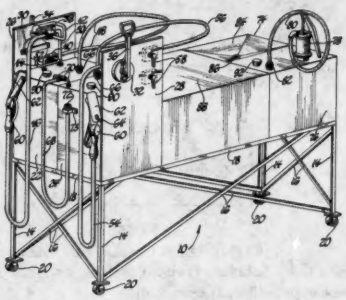
SMALL ENGINE SERVICE CENTER

Michael C. Pierno, 16146 Beverly Road, Birmingham, Mich., and Vincent J. Figas, 19716 Damman, Harper Woods, Mich.

Filed July 30, 1970, Ser. No. 59,605

Int. Cl. F16k *51/00*

U.S. Cl. 137—342 **9 Claims**



A mobile flammable fluid handling assembly including a regular fuel tank and a mixed fuel tank juxtaposed to one another and spaced by a platform from a used oil tank and a new oil tank. A manually actuated pump is associated with each fuel tank and is connected through valves to the associated tank and to a fill hose and a siphon hose. The valves for each tank may be positioned in "fill" or "siphon" positions so as to deliver fuel from the associated tank through the fill hose when in the "fill" position and to draw fuel into the associated tank through the siphon hose when in the "siphon" position. A vent hose is connected to the fuel tanks and has a quick disconnect fitting on the free end thereof. A manually operated pump with a hose attached thereto is connected to the new oil tank.

3,670,763

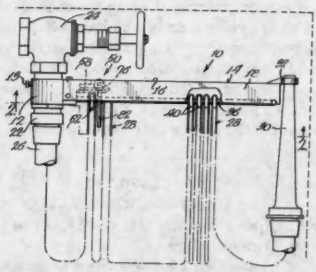
SEMIAUTOMATIC HOSE RACK

John T. Magdars, Northbrook, Ill., assignor to General Fire Extinguisher Corporation

Filed Feb. 19, 1971, Ser. No. 116,966

Int. Cl. B65h *75/34*, *75/38*

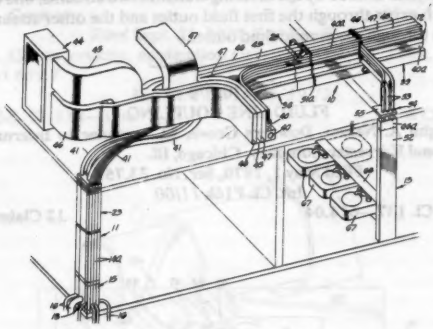
U.S. Cl. 137—355.18 **5 Claims**



A fire fighting water hose rack of the type capable of storing a long collapsed hose compactly in upright folded loops draped over a plurality of support links which sequentially release such loops as the hose is withdrawn from the rack,

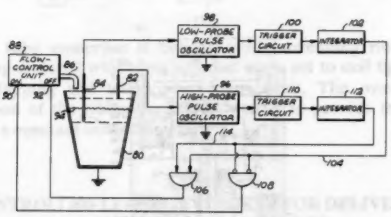
outer end first. The rack is mountable adjacent a water supply pipe with the hose connected downstream of a valve. The hose rack has an improved clamping means for temporarily closely off the flow of water through the loops until the hose is drawn out of the rack and substantially straightened, even though the valve is opened.

3,670,764
BUILDING UTILITY AND SERVICE SYSTEM
James A. Tindal, 18002 Mettler Avenue, Gardena, Calif.
Filed Feb. 4, 1971, Ser. No. 112,557
Int. Cl. F16l 5/00
U.S. Cl. 137—357 **29 Claims**



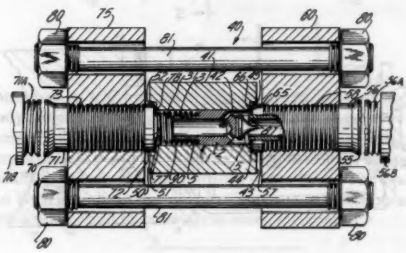
A building utility and service system which can be modified and rearranged according to the changing demands and requirements of the building generally comprises one or more collector units which collect various incoming utilities and services and extend them to the floors in the building, distributor units which distribute utilities and services from a collector unit throughout each floor, and utilization units which dispense certain utilities and services from a distributor unit to one or more outlets on a floor utilizing those certain utilities and services. Each unit includes portable transport sections comprised of a plurality of individual pre-fabricated elements which can be added to or stripped from the transport sections to alter their capacities and various connectors, connecting lines and transition components having quick connect and disconnect capabilities which interconnect the elements of the units and provide flexibility to the system.

3,670,765
LIQUID LEVEL SENSOR INCORPORATING PULSE TECHNIQUES
Joel E. Haynes, 11735 Luanda, Lakeview Terrace, Calif.
Filed July 27, 1970, Ser. No. 58,507
Int. Cl. G05d 9/12
U.S. Cl. 137—392 **6 Claims**



A system is disclosed for sensing levels of electrically-conductive liquid by utilizing the liquid as a switch in cooperation with electrical probes. The destructive effects of liquid conduction on the probe are avoided by the use of pulse techniques. A pulse generator operates when the liquid under observation attains a probe-contact level to complete an electrical circuit. The pulse generator is disclosed in the form of a relaxation oscillator which pulses a trigger circuit, the output of which is integrated to provide a control signal. A plural-probe system is also disclosed. The pulses provided from the pulse generator have an interval of not more than one fifth of the interval therebetween.

3,670,766
POPPET AND VALVE ASSEMBLY
Henry K. Tyson, and Albert Q. Butler, both of Odessa, Tex., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed April 29, 1970, Ser. No. 32,874
Int. Cl. F16k 15/00
U.S. Cl. 137—515.5 **5 Claims**

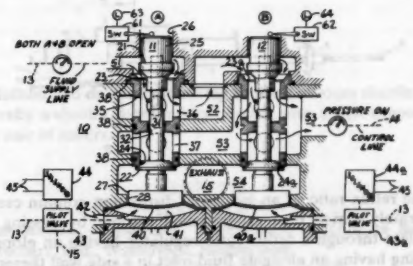


A poppet and valve assembly are designed to eliminate prior art problems of fouling with solid materials, large pressure drop, and cracking due to stress concentrations in the valve systems for checking flow of fluids in tubing.

The valve assembly comprises an elongated valve body, upstream and downstream tailpieces, means for urging these tailpieces in sealing engagement with the valve body and a poppet which is seatable within the bore of the upstream tailpiece.

The poppet comprises an elongated member having a rear end portion, a forward end portion including a tapered shoulder and a substantially continuous and smooth surface area, orifices disposed on the tapered shoulder, a passageway open to the rear of the body member, and conduits communicating between the orifices and the passageway.

3,670,767
SAFETY VALVE ASSEMBLY FOR CONTROLLING CLUTCH AND BRAKE IN POWER PRESS OR THE LIKE
Kenneth R. Mahorney, Bartlett, Ill., assignor to Danly Machine Corporation, Chicago, Ill.
Filed March 8, 1971, Ser. No. 122,008
Int. Cl. F16k 11/10
U.S. Cl. 137—596 **6 Claims**



A valve assembly for a pressurized fluid line controlling a clutch and brake made up of a pair of valves having movable

valve members with separate actuators, each of the valve members having inlet ports and outlet ports, the inlet ports being connected in series and the outlet ports being connected effectively in parallel so that both valves must be activated to pass the pressurized fluid to the control line and so that upon unwanted sticking of one of the valve members in activated position, pressure fluid to the control line is cut off and exhaust fluid from the line is promptly and directly vented.

3,670,768

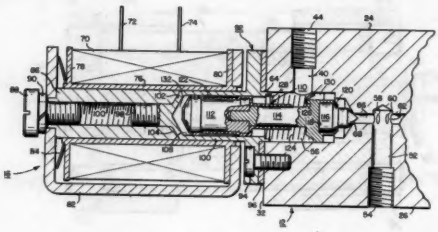
FLUID FLOW CONTROL DEVICE

Augustus W. Griswold, Rochester, N.Y., assignor to Dynak, Inc., Rochester, N.Y.

Filed June 8, 1970, Ser. No. 44,242

Int. Cl. F16k *19/00*

U.S. Cl. 137—606 **16 Claims**



A fluid flow control device including a body having a plurality of inlet passageways and a single common outlet passageway, and a plurality of solenoid valves connected to the body for controlling fluid flow from the inlet passageways to the outlet passageway. The device and the solenoid valves are resistant to corrosive liquids. The amount of residual-liquid left in any inlet passageway downstream from each solenoid valve when that valve is closed is minimized, to provide as sharp a liquid interface as is possible between each liquid leaving the outlet passageway and the next successive liquid.

3,670,769

APPARATUS FOR THE CONTINUOUS ADJUSTMENT OF THE REFLUX RATIO OF A DISTILLATION COLUMN

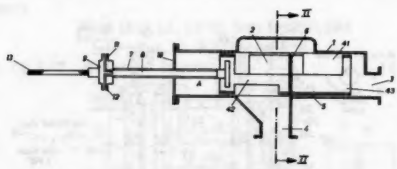
Horst-Dieter Gelderblom, Sindorf, and Manfred Morsdorf, Koln-Weidenpesch, both of Germany, assignors to Chemiebau Dr. A. Zieren GmbH & Co. K.G., Koln, Germany

Filed June 30, 1970, Ser. No. 51,295

Claims priority, application Germany, June 30, 1969, P 19 33 056.4

Int. Cl. F16k *51/00*

U.S. Cl. 137—610 **11 Claims**



The reflux ratio of an industrial distillation column can be accurately varied in a programmed manner by passing the distillate through a reflux ratio regulator having an elongate housing having an elongate fluid inlet in a side wall thereof, a partition fitted axially in the housing perpendicular to the axis of the inlet and movable axially between the ends of the inlet; a first fluid outlet positioned on one side of the partition; a second fluid outlet positioned on the other side of the partition; means for varying the position of the partition along the inlet during the distillation, so that the partition divides the stream of distillate entering the housing in a varying ratio into two streams, one being withdrawn as distillate and the other being returned as reflux; and, optionally, a liquid stream divider downstream of the reflux ratio regulator comprising an elongate housing having in the side walls thereof a fluid inlet connected to one of the fluid outlets of the reflux ratio regulator and two fluid outlets, one connected to the head of the distillation column and one to means for collecting the product; a weir with a plurality of overflow indents in its upper edge positioned axially in said housing between the fluid inlet and the fluid outlets; and a liquid stream dividing wall mounted transversely in said housing and mounted perpendicularly to the weir, so that the stream of liquid flowing over the weir is divided by the dividing wall into two streams, one of which exists through the first fluid outlet and the other stream exits through the second fluid outlet.

3,670,770

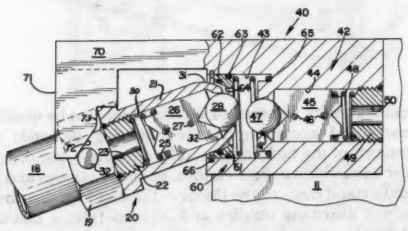
FLUID LINE COUPLING

Vaughn A. Nelson, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed May 1, 1970, Ser. No. 33,757

Int. Cl. F16k *11/00*

U.S. Cl. 137—614.04 **12 Claims**



A telescopic linear type fluid line coupling having a valved female housing carrying reciprocable sealing means, and a camming surface, a valved male coupling element having cam means thereon, said cam means and said camming surface being cooperative to effectuate interconnection of said male and female portions.

3,670,771

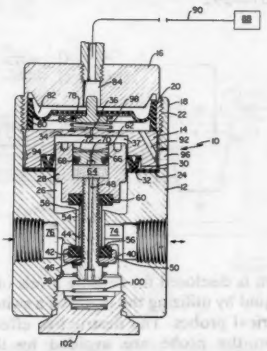
FLUID OPERATED BOOSTER VALVE

Albert W. Dewberry, Littleton, Colo., assignor to C. A. Norgren Co., Littleton, Colo.

Continuation of Ser. No. 641,927, May 29, 1967, abandoned. This application Dec. 11, 1969, Ser. No. 3,311

Int. Cl. F16k *31/385*

U.S. Cl. 137—625.6 **6 Claims**



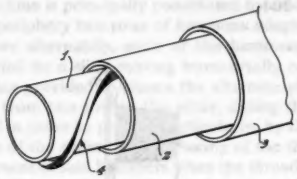
Valve housing with high pressure inlet from line and high pressure outlet to load. Housing has coaxial bores with poppet

or spool valve in small bore to control high pressure flow. Valve connected by stem to piston in large bore and valve is normally urged to closed position with fluid leakage through piston exiting through bleed hole. Closure for bleed hole operated by low pressure piston or diaphragm (1 psi or less) to build up pressure on free end of piston and move it to open valve.

3,670,772
SPACING IN COAXIAL TUBES SYSTEM

Gerhard Ziemek, Hannover, and Friedrich Schatz, Langenhagen, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Sept. 21, 1970, Ser. No. 73,688
Claims priority, application Germany, Oct. 14, 1969, P 19 51 659.7
Int. Cl. F16l 11/12, 59/12
U.S. Cl. 138—114 6 Claims



Coaxial tubes are thermally insulated from each other by means of a spacer comprised of loosely piled tapes which have been sewn together, and helically wound on the respective inner tube.

3,670,773
TUBE

Rene L. Guerster, Maple Glen, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed March 26, 1970, Ser. No. 22,973
Int. Cl. F16l 9/22
U.S. Cl. 138—155 2 Claims

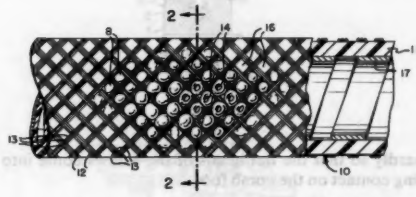
A tube comprises a helical axially extending ribbon of spring material which has adjacent turns set to coil tightly in overlapping and telescoping engagement. The overlapped portion of the ribbon is offset inwardly to provide the tube with a constant outer diameter.

3,670,774
CONTROLLED LEAKAGE CONDUIT FOR DELIVERING A FLUID TO A HEAT SOURCE

William T. Bahr, Wallingford, and Robert V. Lewis, Woodbury, both of Conn., assignors to Anaconda American Brass Company, Waterbury, Conn.

Filed Feb. 11, 1971, Ser. No. 114,616
Int. Cl. F16l 11/12
U.S. Cl. 138—178 6 Claims

A fluid conduit adapted to form ruptured orifices in areas along its length when the areas or portions are subjected to selected temperatures resulting from the proximity of a high temperature heat source, the orifices thereby selectively delivering the fluid to reduce such temperature of the heat source. The conduit includes a pressure-rupturable body and reenforcing elements for reenforcing portions of the body to withstand high temperatures and to assure that the conduit

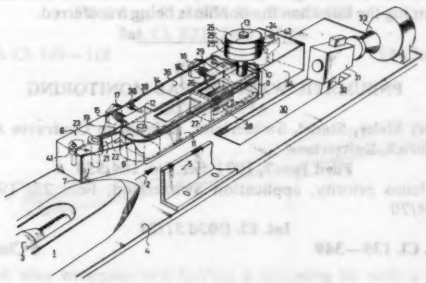


continues to transmit fluid past ruptured conduit areas. The body is adapted to rupture in portions not supported at high temperatures by the reenforcing elements where combined internal pressure and the reduced strength at high temperatures results in failure of these portions of the body. The portions of the body which do not rupture continue to function as a conduit leading fluid to other areas along the conduit.

3,670,775
BRAKING SHUTTLES IN LOOM SHUTTLE BOX

Allan William Henry Porter, Lustmuhle/Ar, Switzerland, assignor to Adolph Saurer Ltd., Arbon/TG, Switzerland

Filed Aug. 20, 1970, Ser. No. 65,442
Claims priority, application Switzerland, Aug. 28, 1969, 13025/69
Int. Cl. D03d 49/54
U.S. Cl. 139—185 4 Claims



Method and device for braking shuttles in loom shuttle box whereby a shuttle is braked by contact with a belt supported by a pair of rollers.

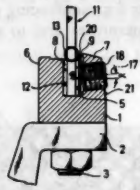
3,670,776
LOOM SLEY

Hans Demuth, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Sept. 23, 1970, Ser. No. 74,802
Claims priority, application Switzerland, Nov. 13, 1969, 16877/69
Int. Cl. D03d 49/62
U.S. Cl. 139—188 9 Claims

The loom sley has a flange in which the pressure screws are initially mounted in angular relation to a perpendicular plane

to the screw contacting surface on the comb. On tightening of the screws against the comb foot, the flange bends elastically



outwardly so that the flat heads of the screws come into full bearing contact on the comb foot.

3,670,777

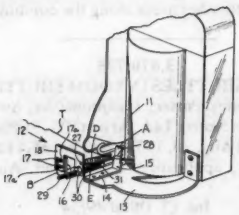
TRANSFER TAIL CLAMPING APPARATUS

John A. Blackstone, 4 Woodridge Drive, Greenville, S.C.

Filed July 24, 1970, Ser. No. 57,992

Int. Cl. D03d *45/26, 45/02*

U.S. Cl. 139—247 **2 Claims**



A transfer tail clamping apparatus used on a bobbin replenishing mechanism has an expansible member, having aligned clamping means, connected adjacent one end with an abutment and on the other end with a movable frame for clamping the tail when the bobbin is being transferred.

3,670,778

PNEUMATIC WARP THREAD MONITORING APPARATUS

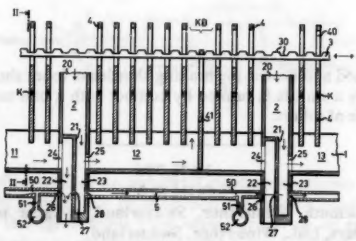
Ghert Meier, Stadel, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Jan. 7, 1971, Ser. No. 104,554

Claims priority, application Switzerland, Feb. 27, 1970, 2894/70

Int. Cl. D03d *51/24*

U.S. Cl. 139—349 **6 Claims**



A warp thread monitoring apparatus for looms wherein each properly tensioned warp thread passes through an associated thread monitoring lamella or blade and retains such in an elevated position, and upon rupture of the relevant warp thread this lamella then drops into a lower position, thereby activating a release or triggering mechanism for sounding an alarm or stopping the loom. According to important aspects of the invention, a channel system is arranged beneath each row of thread monitoring lamellae and upon rupture of the relevant warp thread the corresponding lamella drops into this channel system to interrupt the flow of an air current forced from the inlet side of the channel system to the outlet side thereof. This in turn affects the operation of a pneumatic flow sensing device influencing the trigger mechanism for sounding the alarm or stopping the loom.

3,670,779

DEVICE FOR THE RECOVERY AND REMOVAL OF A FALSE SELVEDGE IN A SHUTTLELESS LOOM

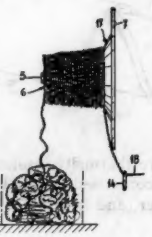
Albert Deborde, Bourgoin-Jallieu, France, assignor to Ateliers Diederichs, Bourgoin-Jallieu Isere, France

Filed Dec. 23, 1970, Ser. No. 100,966

Claims priority, application France, Jan. 20, 1970, 7001839

Int. Cl. D03d *49/20*

U.S. Cl. 139—304 **2 Claims**



A false selvedge in a shuttleless loom is recovered by continuously winding the false selvedge under tension on the larger end of a conical bobbin, the wound selvedge moving progressively to the narrower end of the bobbin at which it progressively falls on to the floor or into a storage receptacle.

3,670,780

CURTAIN HEADING TAPES

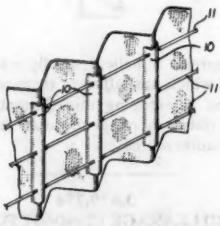
William Wood, Gatley, England, assignor to Thomas French & Sons Limited

Continuation of Ser. No. 762,189, Sept. 16, 1968, abandoned. This application Aug. 6, 1970, Ser. No. 61,829

Claims priority, application Great Britain, Sept. 15, 1967, 42,160/67

Int. Cl. D03d *1/06, 3/02*

U.S. Cl. 139—387 **8 Claims**

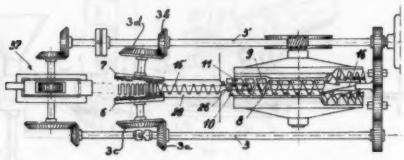


A curtain heading tape having a body and spaced pockets on at least one face thereof, wherein there is at least one draw cord in the tape, the draw cord passing through the body adjacent the edges of the pockets and also passing through the body between the edges of the pockets, thereby forming a reverse bulge immediately behind the pocket for the reception of a curtain hanging device.

3,670,781
MACHINE FOR THE ALTERNATE CAMBERING OF A METALLIC THREAD

Roger Liouville, Colombes, France, assignor to Herckelbout et Fils (Societe Anonyme), Rosny Sous Bois, France

Filed May 1, 1970, Ser. No. 33,544
Claims priority, application France, May 5, 1969, 6914281
Int. Cl. B21f 1/04
U.S. Cl. 140—71 R 4 Claims

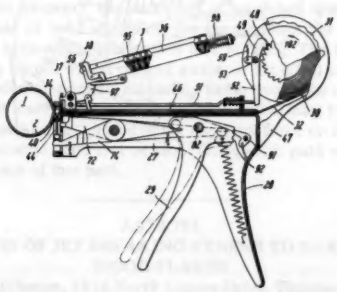


The machine is principally constituted by a wheel comprising at its periphery two rows of hammers adapted to overlap one another alternately, each of the hammers of one row being carried by a slide moving transversally on said wheel, means being provided to ensure the alternate pivoting of the hammers, from one row to the other, during the rotation of said wheel in order to provide particularly, by the transversal movement of the slides, the cambering of the thread and the disengagement of said hammers when the thread is cambered, the latter being eventually taken up by a second device composed of two plates arranged facing one another symmetrically with respect to the direction of advance of the thread and each comprising spiral grooves for the reduction of the pitch of the zig zag cambered thread.

3,670,782
APPARATUS FOR TIEING A BUNDLE OF CABLES

Heinrich Kabel, Quickborn, Holstein, Germany, assignor to Paul Hellermann G.m.b.H., Pinneberg near Hamburg, Germany

Division of Ser. No. 667,286, Sept. 12, 1967, Pat. No. 3,570,554, which is a division of Ser. No. 446,855, April 9, 1965, Pat. No. 3,353,227. This application June 12, 1970, Ser. No. 57,852
Int. Cl. B21f 9/02
U.S. Cl. 140—93.2 10 Claims

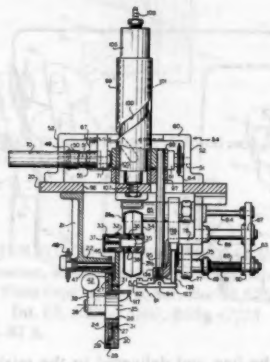


Apparatus for tieing a bundle of cables with the aid of a strap includes holding means for a lock, tensioning means for the strap, operating means for causing a pin to secure the strap and the lock to each other, and cutting means for removing excessive strap material.

3,670,783
CABLE TYING MACHINE

John T. Goodwill, Utica, N.Y., assignor to Goodwill Automated Devices, Inc., New York Mills, N.Y.

Filed Nov. 4, 1970, Ser. No. 86,743
Int. Cl. B21f 15/04
U.S. Cl. 140—93 R 10 Claims

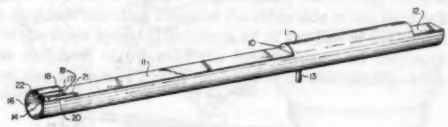


A machine for automatically putting ties on a multi-strand cable at spaced intervals therealong. The ties are made with a single, continuous piece of lacing which extends longitudinally along the cable between the ties. At each point at which a tie is to be made the machine passes the lacing around the cable and then knots the lacing, after which either the cable or the machine is moved to the next tie point. In passing the lacing around the cable, the machine forms a loop in the lacing through which a bobbin carrying the lacing passes to form the knot.

3,670,784
WIRE WRAPPING TOOL

Daniel Whitney Ackerman, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Aug. 11, 1970, Ser. No. 62,825
Int. Cl. B21f 7/00, 15/00
U.S. Cl. 140—118 14 Claims



A wire wrapping tool haVing a wrapping bit with a hole therein adapted to be received by a terminal stud, a wrapping sleeve in which the bit is mounted for limited telescoping movement. The bit has a wire relief flat adjacent a wrapping slot which merges into a tapered counterbore surrounding the end of terminal engaging hole.

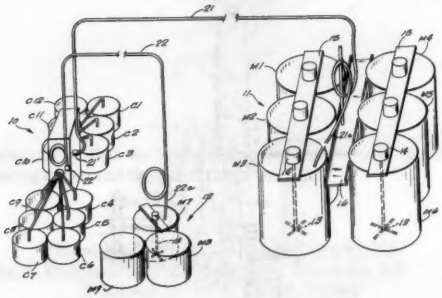
3,670,785
METHOD AND APPARATUS FOR TINTING PAINT

Frederick H. Heiss, and Carl E. Lindblom, both of Rockford, Ill., assignors to The Valspar Corporation, Rockford, Ill.

Filed July 2, 1970, Ser. No. 51,996
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—9 14 Claims

A method and apparatus for batch tinting paint by adding preselected amounts of selected paint colorants to a batch of base paint in a paint vessel at a mixing station. The different paint colorants are stored at a colorant storage station, and a

charge of paint colorant consisting of preselected amounts of one or more selected paint colorants to be used in tinting a batch of base paint are delivered to the inlet end of a single tube delivery line extending from the storage station to the mixing station. The charge of paint colorant is thereafter



purged from the line and delivered to the mixing vessel by passing a purging fluid including a purging liquid compatible with the colorant into the line while delivering the purging liquid and colorant to the mixing vessel.

3,670,786

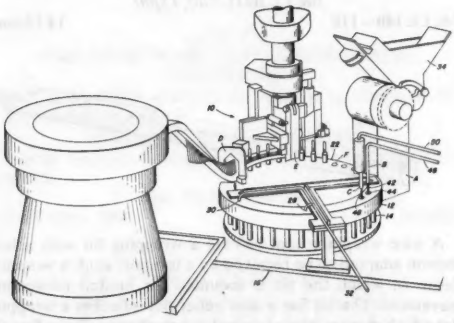
CONTAINER FILLING APPARATUS

Howard J. Levin, Norristown, and Franklin M. Kreider, Lancaster, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 716,521, March 27, 1968, abandoned. This application June 2, 1970, Ser. No. 42,881

Int. Cl. B65b *31/02*

U.S. Cl. 141—92 **4 Claims**



A rotary filling machine which comprises a tunnel disposed substantially from before the filling station to the sealing station of the machine along the direction of travel of a container, and means for introducing an inert gas into the tunnel under a slight positive pressure. The inert gas excludes air from the tunnel and provides an inert gas atmosphere within the tunnel which effectively maintains at a reduced level the oxygen content of the void space of containers being filled. The tunnel has orifices permitting the passage of reciprocating filling spouts for introducing inert gas into the containers being filled and, in a separate step, for filling the containers.

3,670,787

APPARATUS FOR FILLING A CHAMBER

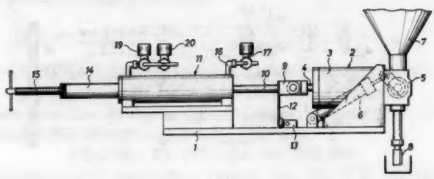
Gerhard Hansen, Hofener Strasse 47, 7013 Oeffingen (Wurtt), Germany

Filed Dec. 10, 1968, Ser. No. 782,613

Claims priority, application Germany, Jan. 3, 1968, P 16 57 206.8

Int. Cl. B65b *3/30*

U.S. Cl. 141—250 **3 Claims**



A fluid flow regulating apparatus uses the control displacement of first and second pistons to vary the fluid flow rate. A reversible two-way valve mechanism is positioned between a supply of pressure fluid and the first and second pistons and valve control means are connected between the two-way valve mechanism and respective ingress and egress ports of one of the pistons. Settable restrictive fluid flow means are connected between the two-way valve mechanism and the control means so that the first piston is displaced at a low speed and at a high speed throughout different portions of its movement.

3,670,788

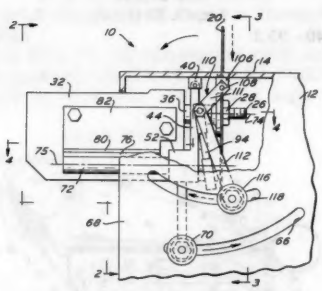
ARBOR SAW

Henry M. Pollak, and Robert S. Pollak, both of c/o American Machine & Tool Co., Inc. of Pa., Royersford, Pa.

Filed May 22, 1970, Ser. No. 39,819

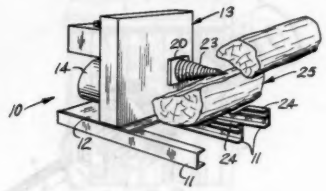
Int. Cl. B27b *5/24*

U.S. Cl. 143—36 R **9 Claims**



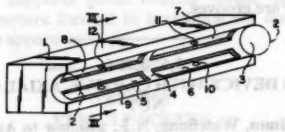
An arbor saw that can be moved vertically with respect to the table on which it is mounted and also displaced about a horizontal axis so as to cut a bevel. An integrated linkage is provided for achieving these two functions so that the blade can be displaced vertically without effecting its angle of bevel, but when the blade is displaced about a horizontal axis it is automatically lowered.

3,670,789
WOOD SPLITTING APPARATUS
John A. Long, 110 Hillview Drive, Cloverdale, Calif.
Filed July 27, 1970, Ser. No. 58,502
Int. Cl. B27l *7/00*
U.S. Cl. 144—193 D **1 Claim**



A device for splitting logs. This device consists of an engine driven shaft having a conical screw thereupon it, the screw serving to penetrate and split logs.

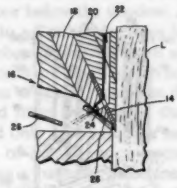
3,670,790
VENEER MACHINE ROLLER PRESSURE BAR ASSEMBLY
Andrew W. Porter, and John L. Sanders, both of Vancouver, B.C., Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada
Filed Feb. 3, 1971, Ser. No. 112,144
Claims priority, application Canada, March 5, 1970, 076573
Int. Cl. B27l *5/04*
U.S. Cl. 144—213 **7 Claims**



A veneer pressure bar assembly is provided wherein the pressure bar or back-up rollers for the pressure bar are supported by hydrostatic lubrication in a housing. The lubricant which may be oil, water, oil and water, or air is fed to at least three slot shaped pockets extending along two paths along the housing (at least one slot along one path and at least two along the other path) on each side of the resultant force on the roller being lubricated. The slot or slots along each path occupy a major portion of that path.

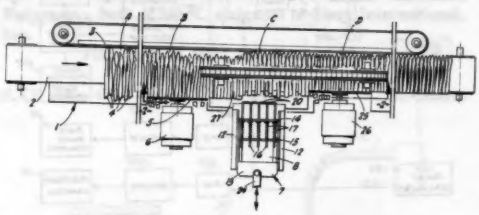
3,670,791
METHOD OF JET BREAKING VENEER TO NARROW WOOD FLAKES
Donald L. Johnson, 1816 North Lenore Drive, Tacoma, Wash.
Continuation-in-part of Ser. No. 630,396, April 12, 1967, Pat. No. 3,526,258. This application July 13, 1970, Ser. No. 54,392
Int. Cl. B27l *11/00*
U.S. Cl. 144—326 A **3 Claims**

Method employing a fluid jet, i.e., the forceful rush of pressurized vapor or gas through an orifice to flex, pull and break more or less continuous veneer along a weak line in the grain from the parent wood to controlled narrow width. The jet breaking occurs while the veneer is being sliced from the parent wood across the grain to predetermined thickness and



length. The flake produced has a defined and predetermined size in all three dimensions.

3,670,792
APPARATUS FOR ALIGNING ASPARAGUS SPEARS
Robert P. Claussen, 4946 West Undine Road, Stockton, Calif.
Filed Sept. 4, 1970, Ser. No. 69,575
Int. Cl. A23n *15/00*; **B65g** *47/28*
U.S. Cl. 146—81 A **6 Claims**

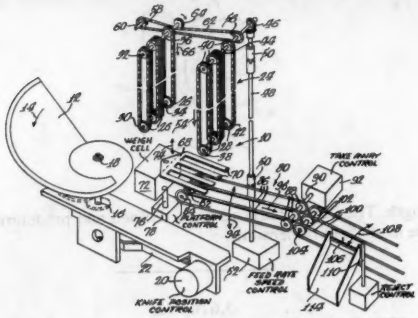


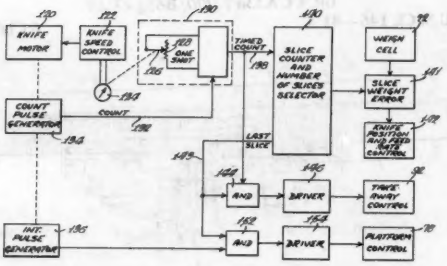
A power-actuated apparatus for tip-aligning asparagus spears disposed transversely on a longitudinally extending, horizontal feed belt preparatory to butt-trimming such spears, by power saw, to equal length; such apparatus including a carriage reciprocable in a direction transversely of the feed belt and from one side thereof, and such carriage being fitted with a multiplicity of spring-advanced but yieldable rods which, as the carriage reciprocates, engage the asparagus spears at the butt end and push such spears transversely of the feed belt until the spear tips engage longitudinally extending, vertical back-stop belt traveling adjacent the other side of the feed belt and at the same speed. This alines all of the tips of the spears in the direction of travel of the feed belt and so that such spears are all cut to equal length when subsequently butt-trimmed.

3,670,793
WEIGHT CONTROLLED SLICING SYSTEM INCLUDING VARIABLE SYNCHRONIZATION CONTROL
Keith E. Flesch, Garrett, Ind., assignor to Peter Eckrich & Sons, Inc.
Filed Dec. 14, 1970, Ser. No. 97,591
Int. Cl. B26d *4/56*
U.S. Cl. 146—94 R **6 Claims**

A weight controlled slicing system for food products wherein the weight of a stack of slices cut from a length of material is accurately controlled. The system includes a knife with a variable speed drive including a speed control system, a slice receiver that receives slices as they are cut and an intermittently operable take-away conveyor for removing slices from the slice receiver after a predetermined number of slices are cut. Also included is a one-shot circuit responsive to the speed control system of the motor for progressively advancing the point at which the take-away conveyor is actuated as the speed of the motor increases to compensate for the fixed time required to actuate the take-away conveyor thereby enabling

accurate retaring of a weigh cell associated with the slice receiver in readiness for the cutting of the next stack and





precluding interference between the slices of one completely cut stack and the first slice of the next succeeding stack as it travels to the slice receiver.

3,670,794

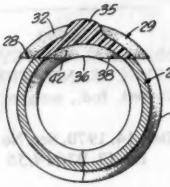
SELF-LOCKING TUBULAR INSERT

William F. Beidler, La Habra, Calif., assignor to Treadline Fastener Corporation, Covina, Calif.

Filed Oct. 24, 1969, Ser. No. 869,164

Int. Cl. F16b *39/34*

U.S. Cl. 151—7 **17 Claims**



A self-locking tubular insert with an outer screw thread for engaging an outer complementary threaded member and with an inner screw thread for engaging an inner complementary threaded member has a transverse peripheral slot forming a window and a deformable plastic locking element seated in the slot is shaped and sized for compression by the outer complementary member to be bulged thereby inwardly into locking engagement with the inner complementary member.

3,670,795

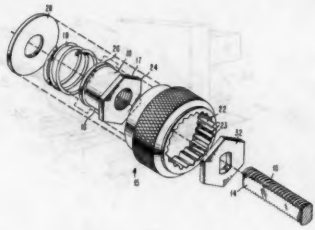
SELF-LOCKING FASTENER

Wilbur J. Kupfrian, Binghamton, N.Y., assignor to Barry Wright Corporation

Filed June 29, 1970, Ser. No. 50,047

Int. Cl. F16b *39/02*

U.S. Cl. 151—29 **6 Claims**



A self-locking fastener that involves a polygonal nut threaded onto a splined or keyed spindle. A sleeve generally encloses the nut and is internally grooved to engage the nut, being keyed for movement longitudinally relative to the nut and for imparting rotary motion to it. A spring urges the sleeve to slide in one direction causing one end to project beyond the end of the nut, in which position the projecting portion forms an internally grooved enclosure. A separate polygonal clamping member, slidable but not rotatable on the spindle, and having a number of sides that is a sub-multiple of the number of grooves, is engaged by the sleeve when the fastener is in the fully tightened position at which time the internally grooved enclosure may engage the polygonal edges of the clamping member to lock the nut on the spindle. Retracting the sleeve disengages the projecting portion from the clamping member, and permits the nut to be unthreaded. The clamping member may be of simple washer form, and although having a number of sides corresponding to a submultiple of the number of grooves, the nut may be indexed and locked in as many positions as there are grooves.

3,670,796

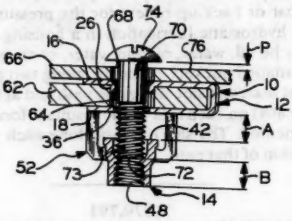
FASTENING DEVICE WITH CAPTIVE, AXIAL FLOATING NUT

David W. Grimm, Watchung, N.J., assignor to Amerace Esna Corporation, New York, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,555

Int. Cl. F16b *41/00*

U.S. Cl. 151—41.75 **8 Claims**



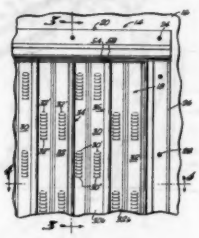
A fastening device such as a clip-nut in which the nut is free to move axially relative to the clip, the axial displacement of the nut being at least of the order of magnitude of the length of travel of the nut necessary to effectively thread the nut upon a mating screw and bring the clamping surface of the nut into clamping engagement against the workpiece to which the clip-nut is affixed such that upon initial insertion of the screw into the clip-nut, axial movement of the portion of the clip which holds the nut captive is limited to no more than that which will only deflect the clip resiliently.

3,670,797

FOLDING CLOSURE CONSTRUCTION

John H. Sassano, Hollywood, Fla., assignor to Weather Control Shutters, Inc., Broward County, Pa.

Filed June 25, 1970, Ser. No. 49,785
Int. Cl. E06b *3/48*
U.S. Cl. 160—118 6 Claims



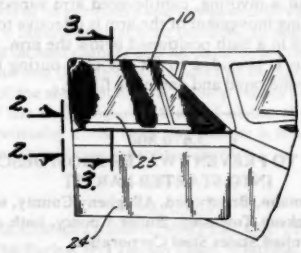
This disclosure concerns an accordian fold closure panel of the type pendantly supported on elevated trackway structure and the type adapted for embodiment in a folding door or window closure or in a pendant folding curtain wall closure. Each hinge joint connection joining adjacent slat elements of the folding closure includes mating pintle and groove portions formed respectively on confronting edge margins of each adjacent pair of vertical slat elements of tee folding closure. The pintle structure of each slat hinge connection is of slotted tube form defining a hollow core axial interior extending coextensive of the pintle structure. The opposite end portions of the hollow axial interior of the pintle structure of each hinge joint connection preferably provide means for fixedly receiving upper and lower oppositely projecting threaded screw elements: an upper hanger screw element is threadedly fixed in the upper interior of the pintle structure of a respective hinge joint connections and pendantly supports the folding closure panel from elevated trolley means; a lower guide screw is threadedly fixed in the lower interior of the slotted tube pintle structure and supports guide bearing means operative in grooveway structure formed in horizontal sill means of the folding closure apparatus.

3,670,798

VEHICLE SCREEN

Marlin F. Hess, and Grace A. Hess, both of 4531 Mayberry Street, Omaha, Nebr.

Filed Aug. 12, 1970, Ser. No. 63,158
Int. Cl. E06b *9/00, 9/52*
U.S. Cl. 160—354 9 Claims



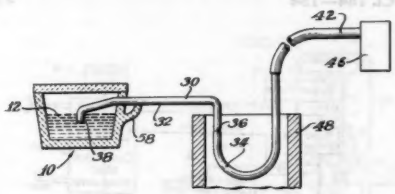
A screen device for vehicle windows comprising a screen material which is secured to the vehicle so that the screen material is positioned at the outside surface of the window. One form of the invention comprises a metal screen material having a flexible attachment means secured thereto which extends around the upper, forward and rearward portions of the vehicle door. The attachment means includes a draw string which is secured to the vehicle door to securely draw the device adjacent the window. The attachment means may also include a flexible magnet means at the lower edge thereof which holds the lower end of the device on the exterior surface of the vehicle door below the window. A second form of the invention relates to a flexible sleeve or boot comprised of netting material which extends over both sides of the upper end of the vehicle door to provide a screen on both sides of the window. A third form of the invention is disclosed which is similar to the second form except that the flexible netting material is positioned only at the outside surface of the window. A fourth form of the invention pertains to a flexible netting material having a magnetic attachment means extending around the border thereof to facilitate the attachment of the device to the exterior surface of a station wagon at the rear side window area. A fifth form of the invention is also disclosed and is similar to the fourth form with a magnet means being employed thereon for aiding in attaching the screen to the vehicle. A sixth form of the invention is disclosed which is adapted to be mounted at the rear window area of a station wagon.

3,670,799

METHOD AND APPARATUS FOR SIPHONING MOLTEN METAL TO A CONTINUOUS CASTING MACHINE

Ralph A. Vogel, Three Rivers, and Harold S. Moss, Kalamazoo, both of Mich., assignors to Essex International, Inc.

Filed Jan. 14, 1971, Ser. No. 106,384
Int. Cl. B22d *11/10*
U.S. Cl. 164—63 20 Claims



A method and system for siphoning molten metal, such as copper or aluminum. A first vessel with molten metal therein and a casting chamber are provided, the casting chamber receiving the molten metal from the first vessel. A continuous tubular member is provided and has a first section and initially has a second section. The first section has an inlet end which is positioned in the first vessel and in the molten metal and has an outlet end which is positioned in the casting chamber. The second section has a discharge end which extends outside the casting chamber.

3,670,800

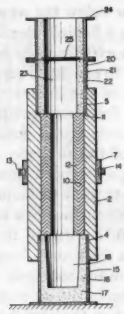
CASTING PROCESS FOR ROLLS

Jacques De Vos, Ekeren, Belgium, assignor to United States Pipe and Foundry Company, Birmingham, Ala.

Filed June 2, 1969, Ser. No. 829,193
Claims priority, application Belgium, June 12, 1968, 48027
Int. Cl. B22d *23/00*
U.S. Cl. 164—95 5 Claims

The invention consists of a method for making solid rolls, for example, metal working rolls, wherein a cylindrical shell comprising the roll working surface is first centrifugally cast in a horizontal cylindrical mold having removable end plates, and as soon as the shell has solidified, the end plates are removed, the mold containing the hot solidified cylindrical shell is mounted between two journal molds to form a complete roll mold, and metal of suitable composition is cast

in the mold whereby there is formed a solid roll core which is metallurgically bonded to the said hollow shell and has integrally formed journal portions extending beyond the cylindrical shell.



3,670,801

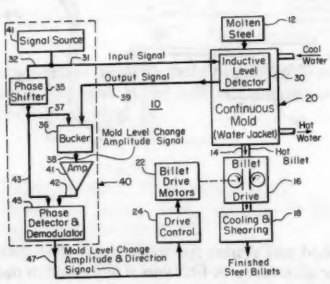
CONTINUOUS CASTING MOLD LEVEL CONTROL

Jack R. Crowell, Cedar Lake, Ind.; James R. Tomashek, Wood Dale, and Donald H. Ward, Glen Ellyn, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 16, 1970, Ser. No. 3,421

Int. Cl. B22d *11/12*

U.S. Cl. 164—154 **4 Claims**



A molten metal continuous casting mold level control system is disclosed employing an inductance detector positioned within a water cooled continuous casting mold. The detector is mounted in the jacket of the mold about the generally hollow cylindrical mold core which core includes an electrically conductive form having a billet shaping surface. The output voltage from the detector is bucked against a signal that is related to an input signal, filtered and amplified to derive a signal whose polarity from a reference level and magnitude are proportionate to the direction and magnitude of change in the steel level. This signal is used to control the billet drive to correct changes from the desired level.

3,670,802

VACUUM CASTING APPARATUS

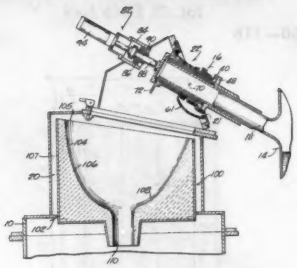
David M. Krick, Waukesha; Lawrence D. Koltz, Hartford, and Warren C. Williams, Waukesha, all of Wis., assignors to Wisconsin Centrifugal, Inc.

Filed Jan. 23, 1969, Ser. No. 793,335

Int. Cl. B22d *27/16*

U.S. Cl. 164—258 **19 Claims**

A centrifugal casting machine is mounted in a vacuum chamber, a vacuum furnace, a vacuum pump is selectively connectable to the furnace and to the vacuum chamber, and a nozzle assembly for the vacuum furnace is connected to the vacuum chamber by a flexible seal.



3,670,803

CHILL CASTING MACHINES

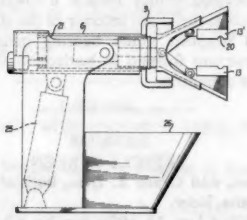
Willi Dehnhard, Ander Niers 35, 417 Geldern, Germany

Filed April 4, 1969, Ser. No. 813,663

Claims priority, application Germany, Aug. 14, 1968, P 17 58 822.6

Int. Cl. B22d *15/04*

U.S. Cl. 164—267 **8 Claims**



A chill casting machine wherein chill halves are mounted on the free end of a pivoting, cantilevered arm supported by a column. Pivoting movement of the arm is effective to immerse the chill halves in a bath positioned below the arm. A second pivoting means is provided to tilt the chill during the filling thereof to provide rapid and complete filling.

3,670,804

TRAP DOOR TO PREVENT WATER FROM DESCENDING INTO STARTER BAR PIT

Gottfried Hofmann, Brentwood, Allegheny County, and James T. Stull, Jackson Township, Butler County, both of Pa., assignors to United States Steel Corporation

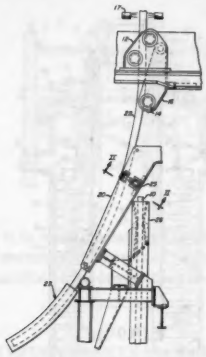
Filed Sept. 10, 1970, Ser. No. 70,973

Int. Cl. B22d *11/08*

U.S. Cl. 164—274 **5 Claims**

An apparatus for deflecting the flow of water into the casting path of a continuous-casting machine. A trap door is hingedly fixed above a starter bar exit hole in a casting guide mechanism. The trap door is pivoted out of the path of the starter bar to permit the bar access to the bar receiver and is

pivoted into position over the access hole to deflect cooling water down the casting guide. The trap door may be made of a



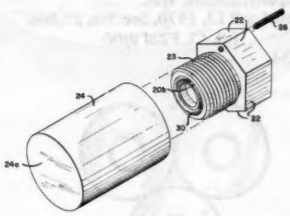
marginal frame covered by a thin sheet of readily penetrable material.

3,670,805

DIE CASTING PLUNGERS

Merle E. Weiers, P.O. Box 176, Mammoth, Pa.

Filed March 30, 1971, Ser. No. 129,479
Int. Cl. B22d *17/04*
U.S. Cl. 164—312 5 Claims



A dummy block is provided for a plunger of a die casting machine having a container with a cylindrical plunger chamber in which the dummy block moves a molten mass of metal fed to said chamber from said chamber to a die by a forward plunger stroke and is returned to its starting position by a rearward plunger stroke, said dummy block comprising an inner shell nut member having spaced wrench receiving flats at one end of its periphery and peripheral threads at the other end and a hollow central bore threaded to engage a threaded male end on said plunger and an outer cylindrical shell closed at one end and threaded at the other to engage the peripheral threads of the shell nut and radial stop means in the hollow interior of the shell engaging the end of the shell nut in axial bearing whereby thrust from the plunger is transmitted to the shell through said stop means and threads.

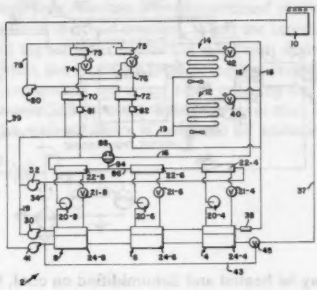
3,670,806

AIR CONDITIONING SYSTEM AND METHOD

Alden I. McFarlan, 691 Dorian Road, Westfield, N.J.

Filed June 29, 1970, Ser. No. 50,874
Int. Cl. F24f *3/00*
U.S. Cl. 165—22 7 Claims

Air conditioning systems having a plurality of refrigeration units with a hot water stream flowing through the condensers in series, and with a chilled water stream flowing through the evaporator-chillers in series. The system balances the heating and cooling loads so that the internally produced heat is used to heat the periphery when such heat is required. Excess heat is dissipated, and additional heat is provided when needed. The temperature of the hot water is higher than with the normal practice, and special advantages are obtained from the standpoint of providing efficient and dependable operations with wider ranges of the load and ambient conditions.

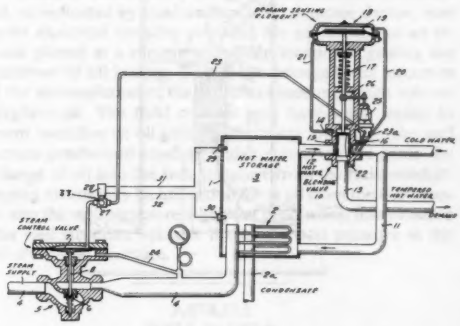


3,670,807

STORAGE TYPE HOT WATER HEATING SYSTEM

John T. Muller, Nutley, N.J., assignor to Leslie Co., Lyndhurst, N.J.

Filed Sept. 4, 1968, Ser. No. 757,236
Int. Cl. G05d *23/13*
U.S. Cl. 165—39 3 Claims



A hot water heating system which includes a storage tank with a specially arranged heat exchanger therein, together with at least one blending valve and a valve for controlling the heat supply to the heat exchanger, and also including a fluid connection whereby a change in demand for blended hot water from the blending valve causes an instantaneous change in the heat supplied to the tank which is proportional to the change in demand and takes place before any material change in the temperature of the water flowing from the tank to the hot water blending valve.

3,670,808

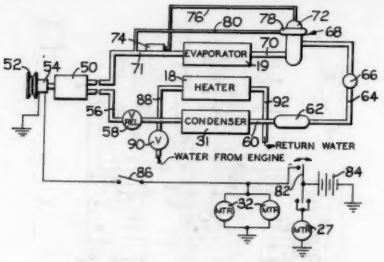
HEATING AND AIR-CONDITIONING SYSTEM FOR CONSTRUCTION EQUIPMENT

John D. Wait, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 9, 1970, Ser. No. 9,583
Int. Cl. B60h *3/00*
U.S. Cl. 165—42 5 Claims

A combined heating and air-conditioning system is provided with a heater coil and evaporator coil located back to back in a single housing enabling the use of common controls and

common duct system for both heating and cooling. The heater coil is placed ahead of the evaporator coil in the air flow so



that air may be heated and dehumidified on cool, humid days and warm air from the heater may be used to prevent the evaporator coil from frosting over.

3,670,809

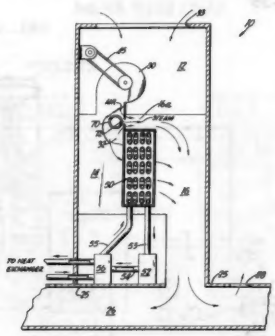
ENVIRONMENT CONDITIONING APPARATUS

Mahmoud S. El-Tahry, Passaic, N.J., assignor to Blazer Corporation, East Rutherford, N.J.

Filed May 21, 1970, Ser. No. 39,268

Int. Cl. F24f 3/14

U.S. Cl. 165—60 **5 Claims**



Computer environment conditioning apparatus employs a first air flow path for recirculating air through an evaporative cooling element for cooling purposes. A portion of the incident air flow is diverted to a by-pass duct where water vapor is added thereto, the initially dry air readily accepting the vapor. The cooled and humidified air flow streams are then combined, and discharged into the controlled environment. The humidifying operation is reliably and efficiently accomplished without regard to the operative status of the cooling equipment.

3,670,810

HEAT EXCHANGER

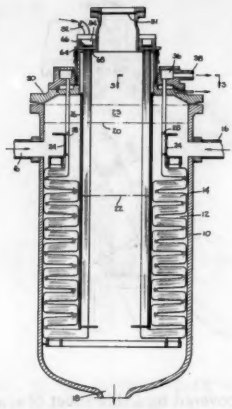
Robert C. Allen, Sr., Wauwatosa, Wis., assignor to Atomic Power Development Associates, Inc., Detroit, Mich.

Filed Jan. 15, 1971, Ser. No. 106,863

Int. Cl. F28f 11/00

U.S. Cl. 165—70 **12 Claims**

A heat exchanger characterized by a vessel containing a plurality of tubes passing therethrough and an upper cover assembly having a first ring-shaped tube sheet and a header assembly mounted on said cover assembly and having a second ring-shaped tube sheet disposed above said first tube sheet in spaced relationship to a drain space between the two tube sheets, and means for connecting the header to the vessel to



provide expansion movement of the header assembly with respect to the vessel.

3,670,811

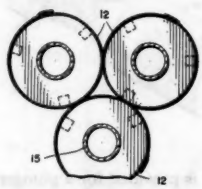
PROTECTION-SLEEVE FOR FINNED-TUBES OF HEAT-EXCHANGER CORE-UNIT

Donald W. Christensen, Racine, Wis., assignor to Young Radiator Company, Racine, Wis.

Filed April 13, 1970, Ser. No. 27,906

Int. Cl. F28f 9/00

U.S. Cl. 165—134 **2 Claims**



The essential concept of this invention involves a planar strip of flexible material of predetermined length and width having a series of slits formed therein to define small portions of the strip subject to being bent transversely to the plane of the strip to form tabs when the strip is converted into a sleeve for embracive positioning around groups of fins on a fluid-flow tube with the tabs disposed between fins to secure the sleeve against shifting axially of the tube.

3,670,812

HEAT EXCHANGERS

Colin R. Bemrose, Leamington Spa, England, assignor to Associated Engineering Limited, Leamington Spa, England

Filed March 30, 1970, Ser. No. 23,702

Claims priority, application Great Britain, April 10, 1969, 18,537/69

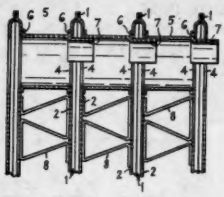
Int. Cl. F28f 9/02

U.S. Cl. 165—175 **9 Claims**

This invention relates to heat exchangers, particularly of the kind used as radiators on motor vehicles, and comprising at least one manifold interconnecting a plurality of passage members through which a liquid coolant can flow.

According to the invention, the passage members are interconnected and held on spaced relationship by means of inter-

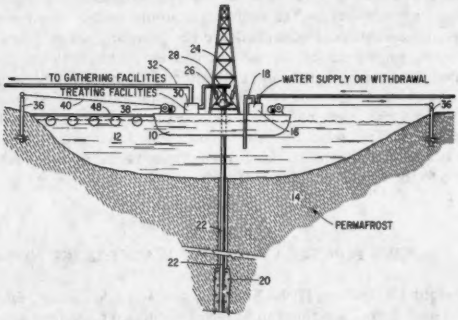
connector members which are bonded to the passage members and which are constructed so that a part of each interconnector member is in nested relationship with the next adjacent interconnector member, the series of nested members thereby providing the manifold interconnecting the passage members.



3,670,813
PONTOON STRUCTURES IN MAN-MADE LAKE FOR ARCTIC OPERATIONS

Floyd R. Duncan, Tulsa, Okla., assignor to Pan American Petroleum Corporation, Tulsa, Okla.

Filed July 30, 1970, Ser. No. 59,402
Int. Cl. B63b *35/44*
U.S. Cl. 166—0.5 **12 Claims**



The surface of the ground in the Arctic is unstable due to settling of the permafrost during thawing periods and to uneven heaving when extreme temperature changes occur within the permafrost zone. Extraction of hot fluids from deep subsurface wells drilled through the permafrost and other sources of heat emission such as from surface installations aggravate and add to the permafrost instability. This causes problems with foundations for surface installations. These problems are relieved by the use of a man-made lake to buoyantly support a surface installation such as a drilling rig, oil treating facilities, etc. The barge supporting the surface installation must be water-tight during periods of thaw and must be of sufficient strength to withstand ice forces in the winter.

3,670,814
UNDERWATER POLLUTION CONTROL

Thomas W. Childers, Woodland Hills, Calif., assignor to Esso Production Research Company, Houston, Tex.

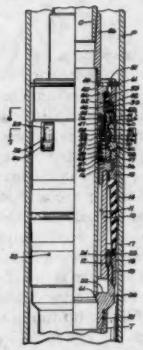
Filed Jan. 2, 1970, Ser. No. 174
Int. Cl. E21b *43/01*
U.S. Cl. 166—.5 **28 Claims**

Oil emanating from a submerged well structure which includes a wellhead and a production manifold is recovered and oil pollution of surface waters and neighboring shorelines is prevented by confining the fugitive oil underwater above an oil-water interface under a roof having side curtains and extending over the well structure. One part of the roof is fixed above the production manifold, and another part of the roof is removably secured over the wellhead and includes structure for coacting with a remotely operated running-in device for removably installing and retrieving such roof part. A fluid conduit opened by an oil-water interace-level detecting device drains oil below the roof to a production conduit of the well structure, for example, the production manifold, by gravity flow. The interface level detecting device opens the conduit when the interface reaches a predetermined minimum level below the inlet of the fluid conduit. When the interface climbs to a selected higher level below the inlet with drainage of oil into the conduit, the interface level detecting device closes the inlet valve, preventing sea water from entering the fluid conduit. Means responsive to the interface level shut in production from the well structure if confined oil accumulates to a predetermined maximum interface level below the inlet of the fluid conduit. Attainment of the predetermined minimum level, as indicated by the interface level detector device, may actuate electrical circuitry provided for connection to an indicator placed at a remote accessible location, signaling the occurrence of oil leakage from the submerged well structure and the accumulation of the predetermined minimum volume of fugitive oil. The fluid conduit may have valve means to prevent backflow of oil into the confining area from the well structure production conduit. Valve means may regulate the discharge of oil into the well structure from the fluid conduit. Pumping means may be utilized to force oil from the fluid conduit into the well structure when the production line pressure in the well structure exceeds the hydrostatic pressure at the level of the well structure.

3,670,815
WELL PACKER

Cicero C. Brown, 5429 Sturbridge Drive, Houston, Tex.

Filed Jan. 22, 1971, Ser. No. 108,884
Int. Cl. E21b *23/02, 23/06, 23/06, 33/126*
U.S. Cl. 166—136 **6 Claims**



A well packer employing a resilient cup-type seal member and releasable means for initially holding the seal member in a

stretched condition to reduce its diameter sufficiently to clear the well wall during running of the packer whereby to obviate damage to the seal member.

3,670,816
OIL RECOVERY PROCESS

Martin E. Chenevert, Houston, Tex., assignor to Esso Production Research Company

Continuation-in-part of Ser. No. 726,693, May 6, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 675,490, Oct. 16, 1967, abandoned, and Ser. No. 699,255, Jan. 19, 1968, abandoned. This application May 4, 1970, Ser. No. 34,012

Int. Cl. E21b *43/22*, *43/25*, *43/26*

U.S. Cl. 166—252 **13 Claims**

A method of displacing oil from a subsurface, water-sensitive, oil-bearing formation is disclosed. The new method involves determining the aqueous vapor pressure of the water-sensitive formation and injecting into the formation through an input well an oil-continuous displacement fluid having water dispersed therein which fluid has an aqueous vapor pressure no greater than that of the formation, and recovering oil displaced thereby from the formation at a point removed from the point of injection.

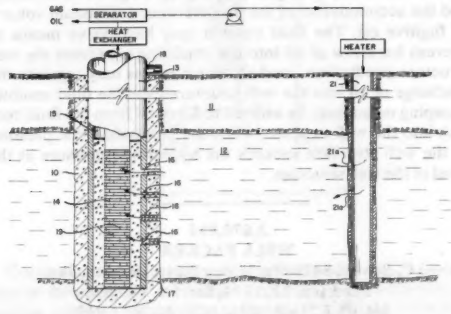
3,670,817
METHOD OF GRAVEL-PACKING A PRODUCTION WELL BOREHOLE

Randolph J. Saucier, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Continuation of Ser. No. 820,758, May 1, 1969, abandoned. This application Nov. 5, 1970, Ser. No. 87,296

Int. Cl. E21b *43/04*, *43/16*

U.S. Cl. 166—252 **8 Claims**



A method of gravel-packing a well borehole extending into an interval of a hydrocarbon-bearing subterranean earth formation by determining the median size of the sand grains in the interval and forming a pumpable slurry of liquid containing granular particles having a relatively narrow range of grain sizes with a median grain size from about 5 to 7 times larger than the median size of grains in the interval. Perforations are formed in a conduit sized to exclude passage of substantially all the slurried granular particles and the conduit is positioned in the well borehole at a depth adjacent to the interval, thereby forming an annulus between the conduit and the interval. A fluid including the slurry is then flowed into the annulus and into contact with the exterior of the conduit until the annulus is substantially filled with the granular particles. Fluids are then flowed from an injection well borehole into the gravel-packed well borehole for recovering of hydrocarbon-bearing fluids therefrom.

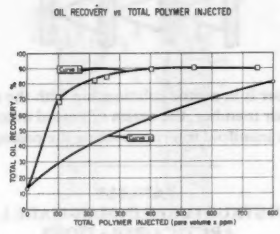
3,670,818
MOBILITY CONTROL IN OIL RECOVERY PROCESSES

Bruce L. Knight, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed April 29, 1970, Ser. No. 33,021

Int. Cl. E21b *43/22*

U.S. Cl. 166—273 **12 Claims**



Improved secondary and tertiary recovery processes wherein a mobility buffer is used are improved by alternately injecting mobility buffer slugs (containing mobility reducing agents) and slugs of water followed by a driving agent. For example, improved crude oil recoveries with emulsion and micellar systems are obtained by alternately injecting aqueous slugs containing mobility reducing agents and slugs of water followed by drive water to displace the system through the reservoir. The mobility buffer slugs can have progressively decreasing concentrations of the mobility reducing agent relative to the initial mobility buffer slug.

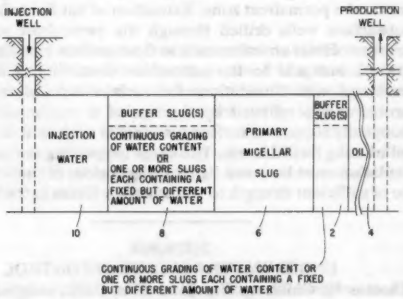
3,670,819
PROCESS FOR TREATMENT OF WATER INJECTION WELLS

Dwight L. Dauben; H. R. Froning, and Loyd W. Jones, all of Tulsa, Okla., assignors to Amoco Production Company

Filed May 18, 1970, Ser. No. 38,365

Int. Cl. E21b *43/22*, *43/25*

U.S. Cl. 166—305 R **13 Claims**


INJECTION WELL
PRODUCTION WELL
BUFFER SLUG(S)
INJECTION WATER
CONTINUOUS GRADING OF WATER CONTENT OR ONE OR MORE SLUGS EACH CONTAINING A FIXED BUT DIFFERENT AMOUNT OF WATER
PRIMARY MICELLAR SLUG
OIL
CONTINUOUS GRADING OF WATER CONTENT OR ONE OR MORE SLUGS EACH CONTAINING A FIXED BUT DIFFERENT AMOUNT OF WATER

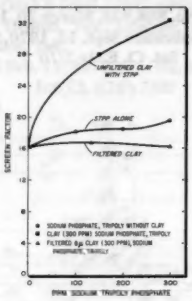
Water injection wells are stimulated by an oil-external micellar slug preceded and/or followed by at least one micellar (buffer) slug of a higher water content. This series of slugs is forced out into the formation by means of a water drive. There may be continuous grading from water to oil-external slug to drive water. The buffer slugs may be continuously graded in water content rather than by injecting distinctly different slug compositions.

3,670,820

OIL RECOVERY METHOD USING DISPERSION OF CLAYS IN AQUEOUS POLYACRYLAMIDE SOLUTIONS

Charles J. Norton, and David O. Falk, Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Aug. 28, 1970, Ser. No. 67,726
Int. Cl. E21b *43/22*
U.S. Cl. 166—305 R **10 Claims**



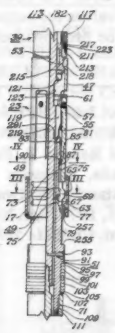
Improved viscosity and resistance factors of aqueous solutions containing partially hydrolyzed polyacrylamide are obtained by dispersing clay, e.g., sodium montmorillonite and phosphates in the solutions. The solutions are particularly useful as displacement fluids in the recovery of petroleum from earth formations.

3,670,821

LOCKING DEVICE AND METHOD AND APPARATUS FOR EMPLACING SAME

Jack W. Tamplen, Rural Route 2, Celina, Tex.

Filed Dec. 21, 1970, Ser. No. 99,762
Int. Cl. E21b *43/00, 23/00*
U.S. Cl. 166—315 **27 Claims**



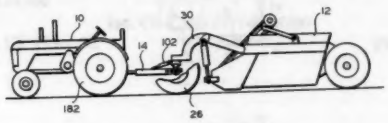
A locking device and method and apparatus for emplacing same within tubing in a well characterized by having locking dogs that are run into the well retracted; and that are operable into a no-go position at a desired depth for thereafter stopping the locking device at the top of a restricted portion such as a nipple; and that can be locked into a recess such as defined by a landing nipple or a collar immediately above the restricted portion. Both the running tool employed in emplacing the locking device, and the locking device, can be armed into the no-go position but cannot be inadvertently locked in the tubing until the locking dogs encounter the restricted portion. Also disclosed are specific and preferred structural embodiments wherein the running tool and the locking device are armed and the locking device locked and left in the tubing by reciprocal movement of the tool in the tubing in conjunction with energy stored in a spring and without the use of complicated electric motors, hydraulic connections or the like.

3,670,822

IMPLEMENT LOAD TRANSFER

Robert L. Reinhardt, Lubbock, Tex., assignor to Clark Equipment Company

Filed July 2, 1970, Ser. No. 52,036
Int. Cl. B62d *53/00*
U.S. Cl. 172—7 **4 Claims**



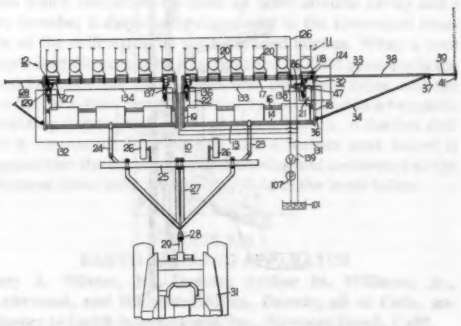
An apparatus is disclosed having hydraulic means for exerting a variable downward force on the tongue of a tractor drawn implement to optimize the tractive pull of the tractor. The apparatus is carried by the implement and includes a linear device connected to sense the drawing force exerted upon the implement and a second linear device connected between the implement and its tongue to exert a downward force upon the tongue that is a function of the drawing force sensed by the first device.

3,670,823

HYDRAULIC ROW MARKER SYSTEM

Ralph W. Matthews, New Berlin; Gerald W. Bernhoft, Wauwatosa, and Michael R. Schmidt, Hales Corners, all of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed June 18, 1970, Ser. No. 47,437
Int. Cl. A01b *25/00, 49/06*; B01c *7/18*
U.S. Cl. 172—128 **4 Claims**



This invention is concerned with marking devices for squadron planters with the marking devices being operated by remote hydraulic devices which are in parallel with hydraulic means used for raising and lowering the planters.

3,670,824

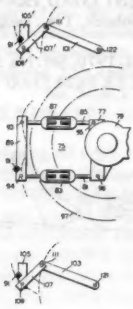
COMPENSATION TOOL BAR DEVICE

Houston H. Buchanan, Route 2, P.O. Box 145, Snyder, Tex.

Division of Ser. No. 860,176, Sept. 19, 1969, Pat. No. 3,533,475, which is a continuation of Ser. No. 645,712, June 13, 1967, abandoned. This application Sept. 16, 1970, Ser. No. 44,617

Int. Cl. A01b *59/06, 63/116*

U.S. Cl. 172—449 3 Claims



A compensating horizontal tool bar for agricultural implements mounted on a tractor having a "three-point hitch" is connected to another transverse horizontal support by two parallelogram connectors and a third connector midway between; the connectors include linkages which permit the tool bar to tilt with respect to a central axis while maintaining the bar's average height substantially constant.

3,670,825

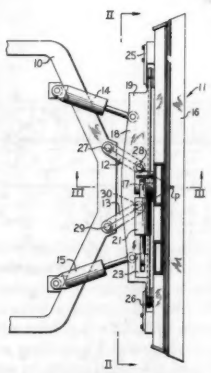
POWER ANGLING BULLDOZER

Jerrold R. Asal, Joliet, and Donald A. Piepho, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 9, 1969, Ser. No. 865,023

Int. Cl. E02f *3/76;* A01b *65/00, 35/22*

U.S. Cl. 172—805 13 Claims



A power angling bulldozer comprises a blade operatively connected to the forward end of a C-frame by spaced links arranged to diverge toward each other forwardly of the frame. A pair of double-acting hydraulic cylinders are pivotally connected between the frame and blade to selectively impart angling movements to the blade for earth-moving purposes. The links are constructed and arranged so that the blade will completely cover and protect the frame during all such movements. A third double-acting hydraulic cylinder may be operatively associated with the blade to selectively impart tilting movements thereto.

3,670,826

CONTROL SYSTEM FOR DRILLS

Laurence B. Hanson, Pine, and Wallace W. Arthur, Denver, both of Colo., assignors to Gardner-Denver Company, Quincy, Ill.

Division of Ser. No. 808,925, March 20, 1969, Pat. No. 3,561,542. This application Sept. 11, 1970, Ser. No. 71,403

Int. Cl. E21c *5/10*

U.S. Cl. 173—4 4 Claims

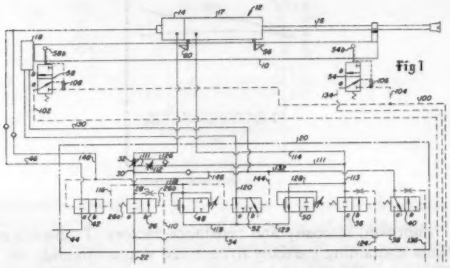


Fig 1

An automatic control system for a guide shell mounted rock drill including a control circuit having pneumatically operated valves for providing pressure fluid to the drill hammer, rotation motor and feed motor and for controlling drill hole flushing medium. Sensors mounted on the drill guide shell provide for reversal of the feed motor and reduced drill power upon reaching the forward end of the guide shell, and shutdown of the drill upon reaching the rearward end of the guide shell. The control circuit includes a series of control valves for selection, at will, by the drill operator of a particular operating sequence or condition of the drill. A control valve is included for providing an operating sequence which includes operation of the drill at reduced power for a predetermined period of time for collaring a drill hole. The control system also includes pressure proportioning valves for automatically regulating the feed motor pressure to be proportional to the drill percussion motor supply pressure.

3,670,827

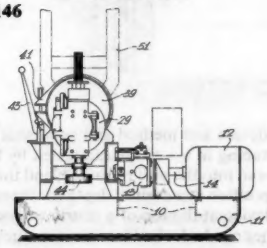
UNDERGROUND DRILLING MACHINE

Lyle W. Hokanson, and Ronald T. Fowke, both of Kirkland Lake, Ontario, Canada, assignors to Heath & Sherwood Drilling Limited, Kirkland Lake, Ontario, Canada

Filed Jan. 6, 1971, Ser. No. 104,385

Int. Cl. E21c *5/06*

U.S. Cl. 173—146 5 Claims



A compactly arranged drilling machine, having all of its components arranged on a single base, is provided. These components comprise a conventional swivel head with hoist-

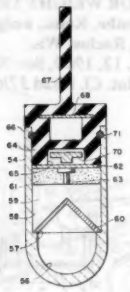
ing drum, a power means therefor including a constant speed motor, a hydraulic pump driven by the motor, a hydraulic motor driven by the pump, and a drive line from the hydraulic motor to the input shaft of the swivel head. The machine is particularly useful to underground drilling operations in which a saving of up to 40 percent in rock removal, as compared with conventional machines, has been achieved.

3,670,828

EXPLOSIVE DRILLING APPARATUS

John D. Bennett, Denton, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

Filed Feb. 11, 1970, Ser. No. 883,082
Int. Cl. E21b 7/00
U.S. Cl. 175—4.5 8 Claims



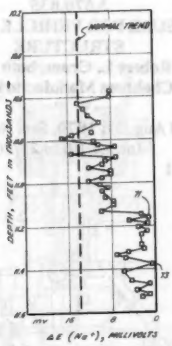
The particular embodiment described herein as illustrative of one form of the invention utilizes an elongated housing having a shaped explosive charge in one end thereof, and a firing mechanism for detonating the explosive charge upon impact of the capsule with the lower end of the borehole. During borehole drilling operations, the capsule is released into a fluid stream and moved to the bottom of the hole with the fluid stream. The capsule then exits through the end of the drill stem and impacts the formation whereupon it is detonated to serve as an auxilliary means for drilling the borehole.

3,670,829

METHOD FOR DETERMINING PRESSURE CONDITIONS IN A WELL BORE FROM SHALE SAMPLES

Harold L. Overton, 5418 Whispering Creek, Houston, Tex.

Filed Nov. 24, 1969, Ser. No. 879,147
Int. Cl. E21b 47/00, 49/00
U.S. Cl. 175—50 10 Claims



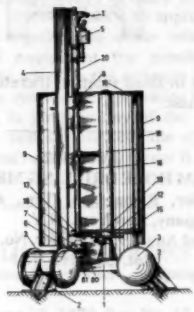
A method for determining pressure conditions in a well bore from shale samples obtained from the well bore at different elevations to thereby determine the requirements for the weight of drilling mud to prevent a blowout of the well. The pressure conditions in the well bore are determined by producing a graphical relationship of the salt which is in free solution in water confined by shale samples obtained at different elevations during the drilling of the well.

3,670,830

DRILLING APPARATUS

Franciscus Theodorus Maria Van Der Wijden, Haarlem, Netherlands, assignor to Werf Conrad en Stork Hijsch N.V., and Nederlandsche Maatschappij voor Werken Buitengaats (Netherlands Offshore Company) N.V.

Filed April 9, 1970, Ser. No. 26,877
Claims priority, application Great Britain, April 9, 1969, 18,144/69
Int. Cl. F21b 19/14, 25/00
U.S. Cl. 175—52 19 Claims



A drilling apparatus is deposited on a submerged floor for cutting a borehole in the floor and removing samples therefrom. The drilling apparatus has a drilling head which is detachably coupled to a string of pipes all detachably connected together by connecting devices which are engageable by axial pushing of the pipes together. The pipes carry inner tubes which cooperatively form an inner annular cavity and a core member is detachably connected to the lowermost inner tube of the drill string by spring-loaded latches. When a core sample is in the core tube it is detached by fluid pressure in the space between the outer pipes and the inner tubes and the core barrel is then pumped upwardly and stored in a turntable containing further drill pipes and core barrels. A further drill pipe is connected in the string and a further core barrel is dropped into the inner tubes of the string and connected to the lowermost inner tube pressurizing fluid in the inner tubes.

3,670,831

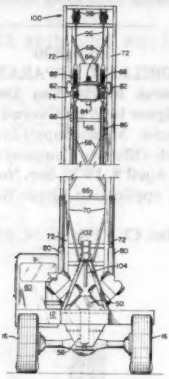
EARTH DRILLING APPARATUS

Henry A. Winter, Jr., Denver; Arthur M. Williams, Jr., Lakewood, and Richard L. Foss, Denver, all of Colo., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 31, 1970, Ser. No. 103,183
Int. Cl. E21b 19/14
U.S. Cl. 175—52 10 Claims

Earth drilling apparatus characterized by a wheel supported vehicle having a pivoted derrick or mast which is movable between substantially horizontal and vertical positions, the pivotal movement of the mast being utilized to transfer horizontal drill pipe, stacked vertically in a stationary magazine, to a reciprocable drilling head carried by the mast. The pipes in the magazine are incrementally moved vertically

to align the uppermost drill pipe therein with the drilling head and a releasable tong device is employed to secure the drill



pipe to the mast in fixed relation thereto during raising and lowering of the mast.

3,670,832

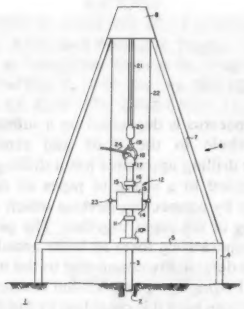
SLIM HOLE DRILLING METHOD

John H. Striegler, Richardson, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,177

Int. Cl. E21b *3/02*

U.S. Cl. 175—57 **4 Claims**



A slim hole drilling method wherein a wellbore of a diameter no greater than about 6 inches is drilled using a drill pipe rotation rate of at least 500 rpm and rotating the drill pipe with at least one electric motor operably connected to the drill pipe. Drilling power units for carrying out the drilling method which employ at least one electric motor in mechanical connection with the drill pipe for rotating the drill pipe and moving with same as it advances toward and away from the wellbore.

3,670,833

METHOD FOR MEASURING A WEIGHING LOAD RAPIDLY

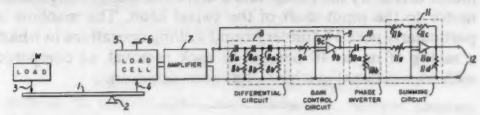
Akuta Tomohiko; Atsumi Seya, and Shinya Hashirizaki, all of Kitakyushu, Japan, assignors to Yawata Iron & Steel Co., Ltd. and Mitsubishi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1970, Ser. No. 66,707

Int. Cl. G01g *3/14*

U.S. Cl. 177—1 **12 Claims**

Where a weighing load is detected as an electrical weighing signal with an oscillatory component due to various oscillations of the weighing elements, the oscillatory component is separated from the original weighing signal and after it is posi-



tively inverted in phase, the inverted separated signal is superposed on the original signal so that the weighing signal is obtained, with the oscillatory signal eliminated.

3,670,834

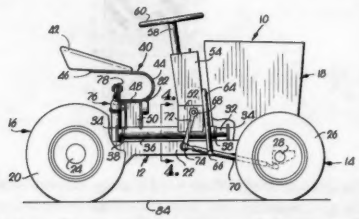
VEHICLE OPERATOR WEIGHT TRANSFER ASSEMBLY

Chester D. Rogers, Olathe, Kans., assignor to Jacobsen Manufacturing Company, Racine, Wis.

Filed Dec. 12, 1969, Ser. No. 884,588

Int. Cl. B62d *37/00*

U.S. Cl. 180—41 **1 Claim**



Increased traction on the high drive wheel of a tractor, self propelled implement or other vehicle while tilted laterally because of sloping terrain is provided by structure which permits shifting of the weight of the operator toward the high side of the vehicle. The operator's seat is held against tilting by a rigid attachment to its mount, but the mount itself is swingable about an axis disposed well below the seat and extending fore and aft of the vehicle. During tilting of the frame to which the seat mount is swingably attached, the operator's weight may be maintained in alignment with and spaced vertically above the central longitudinal axis of the vehicle by operator control of a power device which effects swinging of the seat mount. The steering wheel, instrument panel, dashboard and footrests may also be swung in one direction as a unit with the seat mount about the same single axis common thereto as the vehicle frame, its engine and its front and rear axles tilt laterally as a unit in the opposite direction.

3,670,835

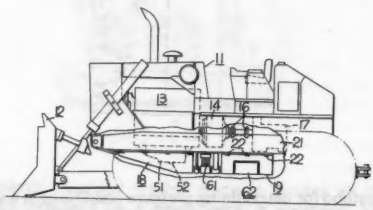
HINGED CLOSURE FOR VEHICLE BOTTOM GUARD STRUCTURE

Roy C. Ross, and Robert L. Crum, both of Springfield, Ill., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 31, 1970, Ser. No. 68,312

Int. Cl. B62d *25/20*

U.S. Cl. 180—69.1 **9 Claims**



A hinged closure for a bottom guard structure of an off-highway vehicle is secured by releasable means independent

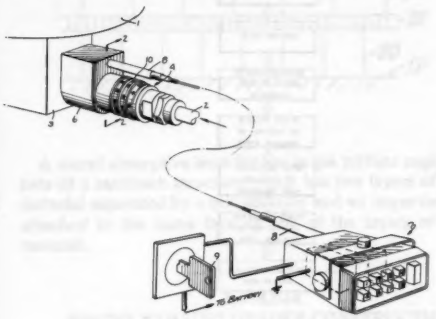
of the hinge in such a manner that the hinge pin is not subjected to load when the closure encounters an obstruction during vehicle operation.

3,670,836

ANTI-THEFT DEVICE FOR MOTOR VEHICLES

William Tonkowich; John A. Meditz, both of Franklin Lakes, and Paul Vignola, Parsippany, all of N.J., assignors to Safetech, Inc., Fairfield, N.J.

Filed July 31, 1970, Ser. No. 59,871
Int. Cl. B60r *25/04*
U.S. Cl. 180—114 **11 Claims**



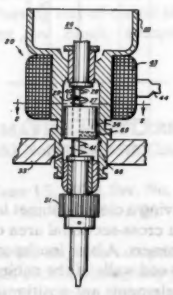
The invention is an electro-mechanical device which is incorporated in the fuel supply system of engine driven vehicles or other engine driven devices to prevent theft or unauthorized use of the vehicle or device. A valve is included in the fuel supply system which cuts off fuel flow except when it is opened by a coded electrical valve control system. The entire anti-theft device is mechanically secure and tamperproof so that it cannot be removed or bypassed by mechanical manipulations without a great deal of effort. The electrical valve control system is made electrically secure and tamperproof so that it cannot bypass or otherwise operated without using the predetermined control code.

3,670,837

ANTI-THEFT APPARATUS FOR A MOTOR VEHICLE

Peter B. Olson, 838 Beaver Ridge Terrace, Broadview Heights, Ohio

Filed Aug. 26, 1970, Ser. No. 66,919
Int. Cl. B60r *25/04*
U.S. Cl. 180—114 **7 Claims**



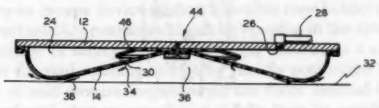
Anti-theft apparatus for a motor vehicle which has a conventional distributor driven by a distributor shaft which shaft is divided into first and second separated portions. A clutch member is provided which in a first position leaves the two shaft portions disconnected and when moved to a second position rotatively connects the two shaft portions together. Electrical coil means are provided adjacent the clutch member and when the coil means are appropriately energized the clutch member is moved from the first to the second position to connect the two shaft portions together which enables the distributor shaft to be rotatively driven. The coil means are made up of a plurality of separate coils, each of which is connected to an electrical power source, such as the vehicle battery, by its own separate electrical circuit. The electrical conductors which make up the separate electrical circuits for each of the coils normally pass through a key actuated switch which is rendered relatively inaccessible to a thief or any other person by means of housing the same within a resin-impregnated assembly or otherwise protected enclosure. As a result of this construction, essentially the only portion of the apparatus which is accessible to a thief are the plurality of conductors which make up the separate electrical circuits and in order to appropriately energize the coil means all of the plurality of coils must be properly electrically connected or else sufficient lifting force will not be provided to move the clutch member from the first to the second position to appropriately connect the shaft portions together. In other words, without appropriate electrical equipment the possibility of a thief properly jumping the wires to the separate coils is rendered relatively impossible. Additionally provision is made in the apparatus whereby if, in jumping any of the coil circuits, the polarity of a given coil is reversed, the clutch member is moved to an inoperative position whereat it is latched in this inoperative position.

3,670,838

INFLATABLE FLUID PAD WITH SHUT-OFF VALVE

William A. Williamson, Niles, Mich., assignor to Clark Equipment Company

Filed June 18, 1970, Ser. No. 47,409
Int. Cl. B60v *1/16*
U.S. Cl. 180—124 **6 Claims**



An inflatable fluid pad including an inflatable diaphragm which forms a portion of a toroidal chamber, an inlet for supplying pressurized fluid to the chamber and at least one opening in the diaphragm for permitting pressurized fluid to flow out of the chamber. Cooperating with the opening is means for preventing fluid flow out through the opening when the diaphragm is deflated and permitting fluid flow out through the opening when the diaphragm is inflated.

3,670,839

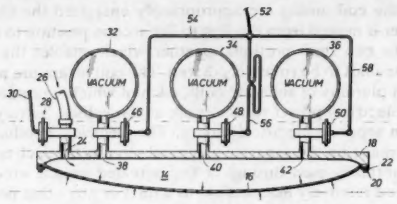
EXTENDED AREA ACOUSTIC IMPULSE GENERATOR

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed July 23, 1969, Ser. No. 844,152
Int. Cl. G01v *1/02*
U.S. Cl. 181—0.5 H **1 Claim**

An acoustic impulse generator for producing in a liquid body acoustic impulses useful, for example, in geophysical explorations. The generator includes a housing which defines an enclosed chamber having a flexible wall. Driving means in one operating condition cause the flexible wall to execute a forward stroke in the liquid body thereby storing potential energy

in the liquid body. The driving means in another operating condition allow the flexible wall to execute a return stroke in a



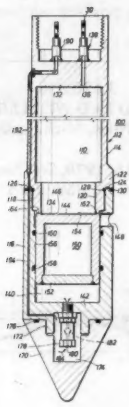
relatively short time interval thereby generating an acoustic impulse.

3,670,840

FLEXIBLE SEISMIC GAS EXPLODER

William J. Gundlach, Fulshear, Tex., assignor to Geo Space Corporation

Filed Aug. 6, 1969, Ser. No. 847,828
Int. Cl. G01v *1/00*
U.S. Cl. 181—0.5 NC **12 Claims**



This invention relates to a repetitive seismic energy source and includes a rigid combustion chamber coupled to a flexible gas supply system for supplying to the chamber a pressurized combustible gas mixture. A piston normally maintains the chamber gas tight. Simultaneously with the ignition of the gas mixture, the piston becomes accelerated away from an outlet of the chamber to abruptly release high-temperature, high-pressure gases into the surrounding water, the underlying earth crust of which is being seismically explored. The displacement of the piston is caused by the combustion of the gas mixture in the combustion chamber.

3,670,841

METHOD OF ADJUSTING A SPEAKER OF AN ELECTRICAL SOUND PRODUCING INSTRUMENT

Marten I. Neff, 42 Phonetia Avenue, Coral Gables, Fla.

Filed May 15, 1970, Ser. No. 37,546
Int. Cl. H04r *1/28*; G10k *13/00*
U.S. Cl. 181—31 R **5 Claims**

A method of adjusting a speaker of an electrical musical instrument to a room in which music is to be played on the instrument through a loudspeaker. A note is sounded through at least one speaker of the instrument, the note having a single fundamental frequency and harmonics including audible high harmonics above the fundamental frequency. The note is monitored as by ear at the speaker to detect the relative volumes of the fundamental frequency and the highest audible harmonic frequency. While continuing to monitor, the speaker is moved close to and relative to a wall of the room until a particular position of the speaker is detected where the volume of the highest audible harmonic relative to that of the fundamental frequency is greater than at surrounding positions. The speaker is fixed at that particular position. Preferably, the same monitoring step is continued while moving a reflector outside and relative to the speaker until a particular position for the reflector is detected where the relative volume at the reflector of the highest audible harmonic is greatest, and the reflector is fixed at that position. Other reflectors may be positioned in the same manner. As a result of the tuning, music played on the instrument has two desirable characteristics: (1) it envelops the listener to the point where the location of the speaker is less noticeable, and (2) it has tonal qualities characteristic, for example, of a good pipe organ; i.e. fullness, roundness, solidity and spread.

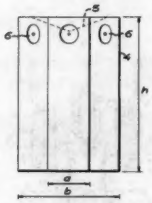
SOUND NOTE HAVING HIGH HARMONICS
MONITOR NOTE
MOVE SPEAKER TO MAXIMIZE HIGH HARMONICS
PLACE SPEAKER AT POSITION OF MAXIMUM HIGHS
MOVE REFLECTOR TO MAXIMIZE HIGH HARMONICS
PLACE REFLECTOR AT POSITION OF MAXIMUM HIGHS
POSITION ADDITIONAL REFLECTORS

3,670,842

LOUDSPEAKERS

Hans Ekdahl, Lund, and Sten Olofsson, Malmo, both of Sweden, assignors to Ekdahl & Olofsson Handelsbolag, Malmo, Sweden

Filed July 23, 1970, Ser. No. 57,702
Int. Cl. G10k *13/00*; H04r *1/28*
U.S. Cl. 181—31 B **2 Claims**

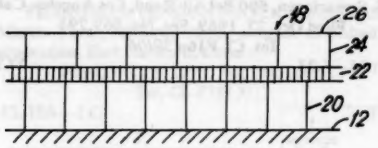


A loudspeaker having a closed cabinet in the form of a right, regular prism with a cross-sectional area of a regular polygon having at least six corners. A bass loudspeaker element is positioned in one of the end walls of the cabinet and at least three treble loudspeaker elements are positioned in each of adjoining cabinet side walls adjacent that end wall in which the bass element is mounted, the angle between the normals to the two remote cabinet side walls in which treble elements are mounted, being at most 120°.

3,670,843
SANDWICH STRUCTURE

John C. Kelly, Hemington House near Shardlow, and Christopher J. Moore, Derby, both of England, assignors to Rolls Royce Limited, Derby, England

Filed Nov. 12, 1969, Ser. No. 875,721
Claims priority, application Great Britain, Nov. 23, 1968, 55,661/68
Int. Cl. F01n 7/16
U.S. Cl. 181—33 G 2 Claims

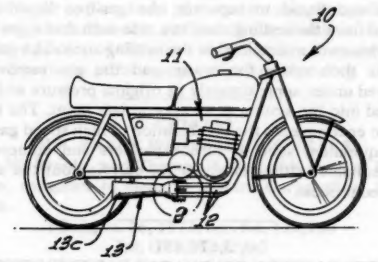


A sound absorptive liner for use in gas turbine engines consists of a sandwich structure which has two layers of cellular material separated by a porous layer and an impervious layer attached to the outer face of one of the layers of cellular material.

3,670,844
ENGINE EXHAUST HEADER CONSTRUCTION

Addison E. Penfold, Jr., Gardena, Calif., assignor to Triple "A" Accessories, Gardena, Calif.

Filed July 1, 1971, Ser. No. 158,775
Int. Cl. F01n 1/08, 7/10; F16l 55/04
U.S. Cl. 181—40 10 Claims



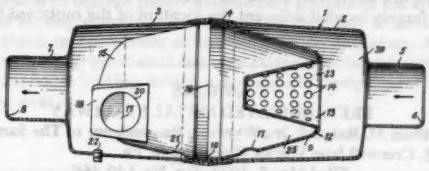
An exhaust header assembly comprises;
a. a multiplicity of exhaust pipes having terminals,
b. a collector tube having an entrance end receiving said terminals in side-by-side relation,
c. said terminals having out-of-round side walls retained in interengagement to block escape of exhaust gas therebetween.

3,670,845
MARINE MUFFLERS

William M. Betts, 302 Northeast 45th Court, Pompano Beach, Fla.

Filed June 15, 1970, Ser. No. 46,423
Int. Cl. F01n 1/08
U.S. Cl. 181—57 5 Claims

A muffler for marine engines comprising a shell or body composed of two half sections integrally joined to produce an outer chamber having an inlet and an outlet port, an inner chamber in the shell having a perforated or foraminous cone at one end of said inner chamber, said cone establishing communication between the chambers, the inner chamber having laterally extending ports at its end remote from the cone, said ports communicating with the outer chamber and with the outlet of said outer chamber. The halves of the outer shell can

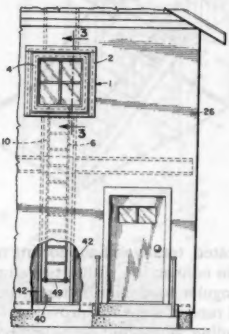


be fitted together in numerous ways to thereby align or disalign the inlet and outlet ports of the shell.

3,670,846
ESCAPE MECHANISM

Lorin M. Jones, 2508 Bellview Avenue, Alexandria, Va.

Filed Dec. 1, 1970, Ser. No. 94,146
Int. Cl. A62b 1/20
U.S. Cl. 182—20 3 Claims

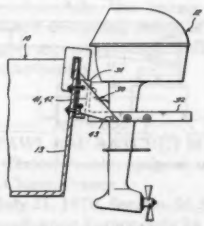


An escape mechanism for use in a building structure whereby an escape device such as a flexible rope ladder can be easily and quickly positioned from an opening in the structure to a position of safety, said ladder being secured to a closure member for said opening and being rapidly positioned by the release of said closure member and the force exerted by the weight of said closure member as it falls from its position on the building structure.

3,670,847
COMBINED PLATFORM AND STEP FOR BOAT TRANSOMS

Arthur F. Mack, Jr., Route 5, Box 30-D, Beaumont, Tex.

Filed March 12, 1971, Ser. No. 123,620
Int. Cl. E04g 7/08
U.S. Cl. 182—92 6 Claims



Combined platform and step for boat transoms, including a member of angular shape movable to two supported positions in brackets mounted on a boat transom, in one position the angular member providing a narrow step for use in entering the

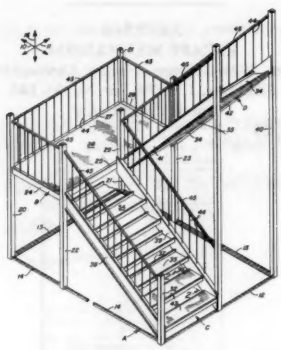
boat, and in the other position the angular member providing an elongate platform from which work may be done upon an outboard motor carried on the boat transom. The apparatus is preferably located adjacent the location of the outboard motor.

3,670,848

PREFABRICATED METAL STAIRWAY

William M. Raiguel, Jr., Wyncote, Pa., assignor to The Samuel J. Creswell Iron Works, Philadelphia, Pa.

Filed May 5, 1971, Ser. No. 140,460
Int. Cl. E04f *11/00*
U.S. Cl. 182—115 **2 Claims**



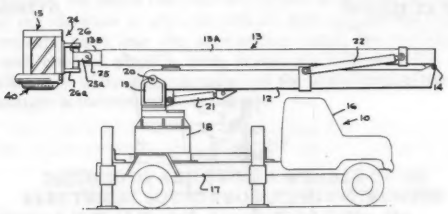
A prefabricated, totally self-supporting metal exterior stairway, for use in connection with a two-story building, is built upon a rectangular load-distributing, ground-bearing frame. Two opposed runs of steps are provided. One run leads from grade to a landing, supported on a rigid box-like support, the loads from which are posted to the ground-bearing frame. The other run leads from the landing to the second floor level. Newel posts link the steps to the ground-bearing frame and internal rigidity is provided by triangulation of members. Treads are of a type which permits field installation of a permanent tread surface.

3,670,849

AERIAL PERSONNEL PLATFORM WITH PROXIMITY SENSING SYSTEM

Edwin Earl Milner, Jr., Williamsburg, Va., assignor to Baker Equipment Engineering Co., Inc., Richmond, Va.

Filed Oct. 23, 1970, Ser. No. 82,936
Int. Cl. B66f *11/04*
U.S. Cl. 182—19 **10 Claims**



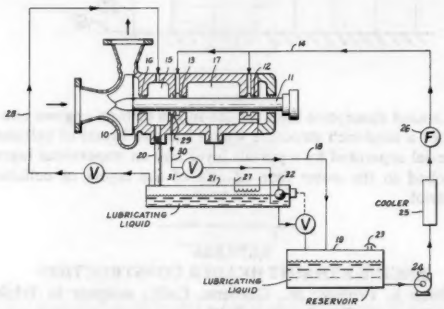
A load supporting platform, such as a workman's basket mounted on the outer end of a boom structure which is adjustable vertically and horizontally, wherein a pair of inflated resilient pneumatic tubes inflated to selected pressure are disposed in outwardly surrounding relation to the lower corner portions of the platform to contact and be deformed by objects or surfaces which are being approached by the platform, together with air pressure activated switch exposed to the pressure conditions in the pneumatic tubing and circuitry activated by the air switch to break the power circuit for the boom structure, collectively serving as a proximity sensing and protective system.

3,670,850

REMOVAL OF DISPERSED GAS FROM LUBRICATING FLUIDS

Judson S. Swearingen, 500 Bel Air Road, Los Angeles, Calif.

Filed Oct. 27, 1969, Ser. No. 869,791
Int. Cl. F16n *39/06*
U.S. Cl. 184—6.23 **7 Claims**



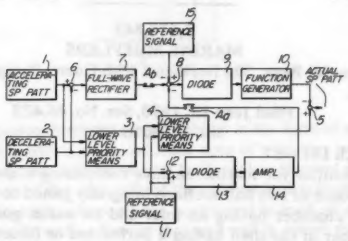
A method for removing dispersed gas from fluids used to lubricate bearings, shaft seals and the like on high speed gas handling equipment such as turboexpanders and compressors which comprises passing the gas-liquid dispersion through a pressurized settling zone for a time period sufficient to allow the gas and liquid to separate, the gas-free liquid being removed from the settling zone at a rate such that a gas and a liquid phase are maintained in the settling zone. The gas-free liquid is then ready for re-use and the gas removed is recovered under approximately its original pressure and reintroduced into the system at an appropriate point. The invention also encompasses the combination of high speed gas handling equipment such as turboexpanders and compressors with a suitable settling chamber for carrying out the above-described process.

3,670,851

SPEED PATTERN GENERATOR FOR ELEVATOR CONTROL SYSTEM

Seiya Shima, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 24, 1970, Ser. No. 75,171
Claims priority, application Japan, Sept. 29, 1969, 44/76938
Int. Cl. B66b *1/28*
U.S. Cl. 187—29 R **5 Claims**



A speed pattern generator for an elevator control system generating an accelerating speed pattern with is a function of

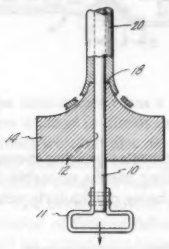
time and increases monotonously, a decelerating speed pattern which is a function of the distance between the elevator and the desired floor level and decreases monotonously, and a compensating speed pattern which is a function of the difference between the accelerating speed pattern and the decelerating speed pattern and decreases monotonously so that the compensating speed pattern ensures a smooth transition from the accelerating speed pattern to the decelerating speed pattern.

3,670,852

FRANGIBLE TENSION SHOCK ABSORBER

Jay Martin Yarm, Milford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 18, 1971, Ser. No. 116,323
Int. Cl. F16f 7/12
U.S. Cl. 188—1 C **16 Claims**



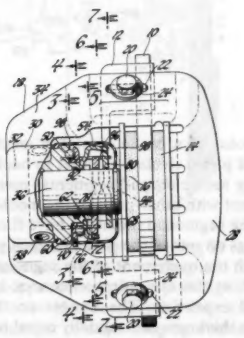
A tension shock absorber comprises a length of music wire, one end of which is passed through a hole in an anvil the diameter of which conforms closely to the diameter of the wire. The portion of the wire which has not passed through the anvil is plated with a frangible metal. Excessive tension forces applied to the unplated end of the wire cause the anvil to peel the plating from the wire. A fixed sleeve closely surrounding the plated portion of the wire a short distance from the face of the anvil prevents premature propagation of peeling.

3,670,853

DISC BRAKE WITH PARKING BRAKE

Frank W. Brooks, and Thomas D. Naismith, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1971, Ser. No. 109,790
Int. Cl. F16d 55/00
U.S. Cl. 188—72.6 **3 Claims**



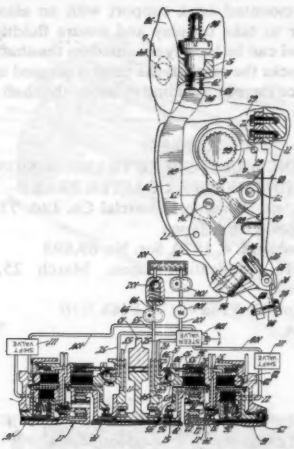
A disc brake caliper includes a hydraulically actuated piston, a frictional locking device comprising a pair of apertured locking plates closely surrounding the piston at a point between the caliper bore and the brake shoe, and a cam device which upon actuation biases the locking plates relative the piston so that the piston is frictionally gripped by the apertured locking plates and carried toward the rotor to actuate the brake independently of hydraulic piston actuation. The piston is not gripped until the cam device is actuated so that the frictional locking device automatically compensates for lining wear.

3,670,854

BRAKE PUMP AIR VALVE AND COOLING MEANS

Raymond J. Maci, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 6, 1970, Ser. No. 52,211
Int. Cl. F16d 65/84
U.S. Cl. 188—71.6 **7 Claims**



A cross-drive transmission having a multi plate brake on each output shaft and a hydraulic and mechanical actuation and cooling system including a cylinder mounted for a rotary and axial movement on a fixed piston and a cam mechanism therebetween responsive to rotary movement of the cylinder to axially move the cylinder for a brake application. Movement of the brake apply linkage connected to the cylinder rotates the cylinder to cause the cam mechanism to mechanically apply the brake against a first rotary plate which assists rotation of the cylinder for a self energizing brake application. On the supply of fluid to the cylinder chamber, the cylinder engages the first plate and rotation thereof actuates the cam mechanism for self energized brake application. The brake plate cooling system has a pump supplying coolant thereto which has an air vent valve in its intake to discontinue cooling fluid supply when the air valve is open by the brake linkage in the brake off position. When the brake is applied, either hydraulically or mechanically, the linkage is respectively either moved by the self energizing action of the brake or by the manual brake apply movement respectively to close the air valve to provide coolant supply.

3,670,855

RELEASABLE PAWL AND RATCHET MECHANISMS

Jean-Paul Lemery, Cluses, France, assignor to Etablissements Carpano & Pons, Cluses, France

Filed July 21, 1970, Ser. No. 56,804
Claims priority, application France, July 24, 1969, 6925298
Int. Cl. F16d 63/00
U.S. Cl. 188—82.3 **7 Claims**

A pawl is coaxially mounted on the shaft of a control button with which it is angularly interlocked but with an angular play.

A spring selectively urges the pawl either towards an operative position in engagement with a ratchet or an inoperative position spaced from the ratchet, selection taking place by turning the control button. When the pawl is in operative position, the ratchet can turn in one direction which oscillates the pawl through an angle smaller than its angular play with the control

button which is therefore not caused to oscillate. The shaft can be loosely mounted on a support with an elastomeric packing member to take up play and ensure fluidtightness; similarly, the pawl can be loosely mounted on the shaft so that when the pawl locks the ratchet, the pawl is pressed against a supporting surface thereby avoiding strain on the shaft.

3,670,856

INTER HOUSING MULTI-SPEED TRANSMISSION HUB PROVIDED WITH A COASTER BRAKE

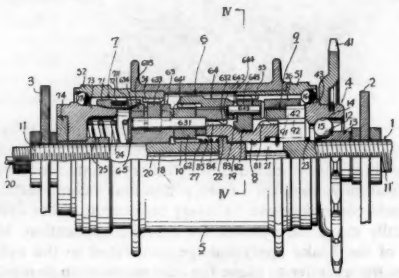
Takashi Segawa, c/o Shimano Industrial Co. Ltd. 77, 3-cho, Oimatsu-cho, Sakai City, Japan

Filed Sept. 4, 1970, Ser. No. 69,693

Claims priority, application Japan, March 25, 1970, 45/25091

Int. Cl. F16d *41/30*; F16h *5/10*

U.S. Cl. 192—6 A **7 Claims**



In the hub shell of a bicycle or the like a gear shifting mechanism mounted to be axially moveable is such that when the pedal is reversely rotated it is transferred in the axial direction and expands the brake shoes to forcibly press the same against the inner walls of the hub shell, thereby braking the rotation of the bicycle wheel. Thus by transferring the gear shifting mechanism for the braking purpose, it is possible at any time when necessary to secure the most reliable braking effect, in whatever speed changing condition the gear shifting mechanism may be or even if any parts thereof are damaged and even if the wire rope thereof has been extended in protracted use.

3,670,857

INTERNAL RESISTANCE FLUID CLUTCH

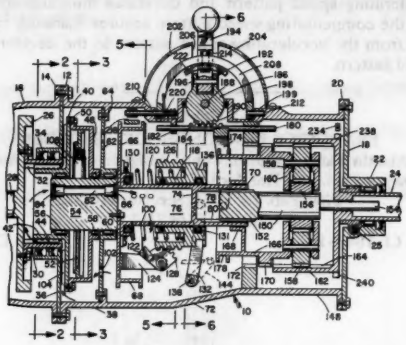
Marion Clark, 546 West Pleasant, Tulare, Calif.

Filed Oct. 28, 1970, Ser. No. 84,804

Int. Cl. F16d *31/02*

U.S. Cl. 192—60 **4 Claims**

A transmission in which the input and output shafts are coupled by a fluid drive which is pressurized by eccentrically driven pumps, the variable speed fluid coupling being effective until a particular rotational speed is reached, at which speed the drive is positively locked. Means is also provided for locking the driven selectively at any speed. The transmission can be shifted between forward and reverse positions, and the



shift mechanism incorporates braking means to facilitate gear engagement, and locking means operable in a stopped position, the arrangement being particularly adaptable to automotive vehicles.

3,670,858

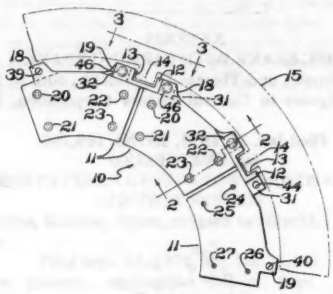
SEGMENTAL FRICTION MEMBER FOR BRAKE OR CLUTCH

Russell F. Van Horn, 1415 Evanston Road, Tipp City, Ohio

Filed April 26, 1971, Ser. No. 137,135

Int. Cl. F16d *13/60*

U.S. Cl. 192—107 R **12 Claims**



A stator or rotor of a brake or clutch mechanism having pairs of stamped plates riveted together in back-to-back relationship forming sector-shaped segmental members for frictional engagement with other parts of the mechanism. Torque links between the segmental members have flanges which are connected to lugs on one of the plates of each pair forming an annulus in which the movement of the segmental members is controlled while at the same time clearance is provided for contraction and expansion. The flanges on the torque link members have a thickness substantially equal to the thickness of one of the plates and a channel portion having a thickness substantially equal to the thickness of the pair of plates providing segmental members of substantial thickness made from stampings and requiring a minimum of machining.

3,670,859

CLUTCH AND CLUTCH COVER

Paul J. Schiefer, Sherman Oaks, and James D. McFarland, Jr., Chatsworth, both of Calif., assignors to Schiefer Manufacturing Company, Monterey, Calif.

Filed Jan. 2, 1970, Ser. No. 117
Int. Cl. F16d *13/60*
U.S. Cl. 192—112 4 Claims

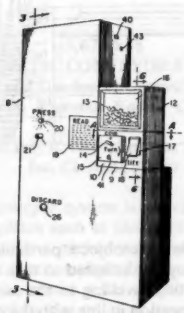
A "Long" type clutch cover has a plurality of windows for the release fingers utilized in disengaging the clutch's pressure plate from the clutch's clutch disc assembly. Each window has a pair of inwardly extending bearing flanges to increase the strength of the clutch cover to resist pressure plate imposed, rotational loads. The corners of the windows are radiused to reduce the likelihood of fatigue failure. Each pair of bearing flanges is engaged by upstanding bosses of a yoke on the pressure plate to provide the load coupling of the pressure plate with the clutch cover. The yokes also provide mounting of the release fingers to the pressure plate, the release fingers also being pivotally mounted to the clutch cover.

3,670,860

SEMIAUTOMATIC VENDING MACHINE INCLUDING MEMORY CIRCUIT

Rudolph L. Allison, Rockford, Ill., assignor to Paramount Textile Machinery Company, Chicago, Ill.

Division of Ser. No. 830,417, June 4, 1969, Pat. No. 3,561,579.
This application Jan. 6, 1971, Ser. No. 104,310
Int. Cl. G07f *15/00*
U.S. Cl. 194—1 J 7 Claims



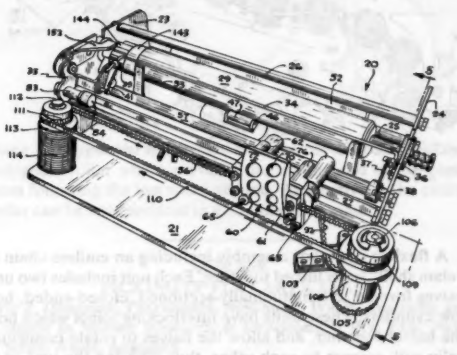
In a vending machine for providing at least one dispensing operation, such as a balloon vending and inflating machine, a memory circuit permitting the depositing of several coins, during one time interval preceding the dispensing operations, for activating a number of dispensing operations, the memory circuit accounting for each coin deposited and provided for a dispensing operation corresponding thereto. As part of one vending machine dispensing operation, magnetic switches indicate the depositing of a coin and signal the memory circuit by activating a counter corresponding to the number of vending operations paid for. A unijunction transistor and silicon controlled rectifier are activated by the counter to signal the customer that he may proceed with the prepaid vending operation. After the customer, through a manually operated control, proceeds with one vending operation, a signal is relayed to the counter. This relayed signal causes the counter to again signal the transistor thereby recycling the next vending operation until all of the stored signals are utilized.

3,670,861

CARRIAGE DRIVE FOR HIGH SPEED PRINTER

Walter J. Zenner, Des Plaines, and Raymond E. Kranz, Mt. Prospect, both of Ill., assignors to Extel Corporation, Chicago, Ill.

Filed Sept. 10, 1970, Ser. No. 71,051
Int. Cl. B41j *19/02*
U.S. Cl. 197—64 14 Claims



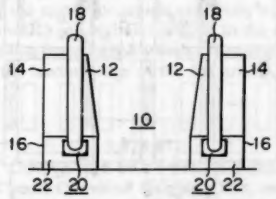
A carriage drive for a high speed dot matrix printer, including a reversible stepping motor connected through a clutch to a rotary driven member that is in turn connected by a belt to the printer carriage. The clutch remains engaged as long as the motor operates in a character-spacing direction, but reversal of the motor disengages the clutch and permits a torsion spring to drive the carriage back to a line start position. Near the end of the return movement, a flywheel decelerator absorbs the kinetic energy of the carriage and then utilizes that kinetic energy to prevent bouncing of the carriage.

3,670,862

SAFETY DEVICES FOR ENTRANCE AND EXIT FOR MOVING HANDRAIL

Katsumi Kito, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1970, Ser. No. 79,199
Int. Cl. B66b *9/12*
U.S. Cl. 198—16 3 Claims



At either of entrance and exit for a moving handrail a front guard of soft, high flexible material and a rear guard of relatively hard material are tandem disposed to encircle the han-

drail to form a closed space between both guards communicating with the exterior through narrow clearances formed between the guards and the handrail.

3,670,863

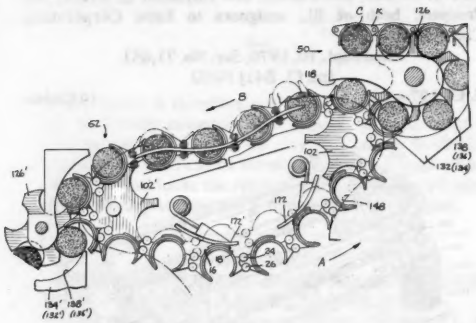
ENDLESS CONVEYOR SYSTEM

Otto H. Meier, Shelburne, and Richard F. Leopold, South Burlington, both of Vt., assignors to General Electric Company

Filed March 31, 1970, Ser. No. 24,198

Int. Cl. B65g 47/00

U.S. Cl. 198—22 R **5 Claims**



A flexible conveyor assembly including an endless chain of "clam shell" units linked together. Each unit includes two unit halves formed as longitudinally-sectioned, closed-ended, hollow cylinders. These units have interlocking joints which hold the halves together, and allow the halves to rotate concentrically with respect to each other, thus allowing the unit to "clam shell" around a cartridge. Each unit assembly is attached to the next adjacent unit by a spherical double-tapered sleeve joint which holds a set pitch to pitch length while allowing roll, fan and twist misalignment between the units. At each end of the element assembly are double pin guides which fit around flexible rod guide rails.

3,670,864

POSITIONING DEVICE FOR ALIGNING PLATES ON A ROLLWAY

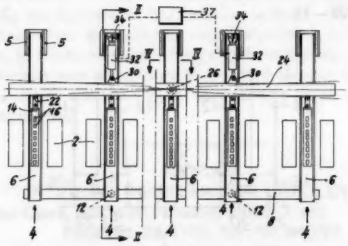
Walter Grandmontagne, Ingbert/Saar, Germany, assignor to Moeller & Neumann GmbH, Ingbert-Saar, Germany

Filed Aug. 20, 1970, Ser. No. 65,468

Claims priority, application Germany, Aug. 25, 1969, P 19 43 068.3

Int. Cl. B65g 47/22

U.S. Cl. 198—29 **6 Claims**



A positioning device for aligning plates on a rollway and not relying on magnetic effects consists of guideways located between adjacent pairs of rollers and frames displaceable on said guideways having support wheels running on the guideways the upper surfaces of which are adapted to engage the plate from beneath to life it clear of the rollway and to deposit it on the rollway after correct alignment.

3,670,865

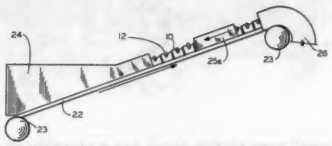
RECTIFYING MEANS

Carl C. Garland, Detroit, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed July 23, 1970, Ser. No. 57,535

Int. Cl. B65g 47/14; B41f 17/36

U.S. Cl. 198—33 AA **7 Claims**



Apparatus means are provided to rectify and convey cap-and-body pharmaceutical capsules, for printing or other work operation, from a random supply of joined capsules, thereby making for significant advantage in materials handling. For labeling purposes especially, this enables selective printing either on the cap, on the body, or on both, with the same or different legends, as desired.

3,670,866

CONVEYOR DEVICES

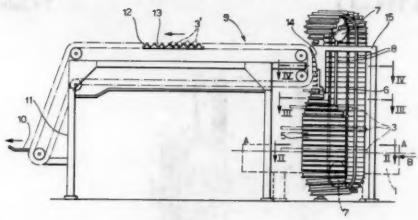
Vanfrido Olivotto, Via Carlo Capelli 85, Turin, Italy

Filed March 8, 1971, Ser. No. 121,640

Claims priority, application Italy, March 23, 1970, 67985 A/70

Int. Cl. B65g 47/24

U.S. Cl. 198—33 AC **2 Claims**



A conveyor for elongate objects particularly glass tubes is disclosed. The conveyor is adapted to turn the tubes through 90° so that, while still travelling in the same direction they change from an orientation in line with the direction of movement to an orientation transverse the direction of movement. The conveyor includes a chain mounted on two parallel sprockets one above the other, and carrying a plurality of movable supports which are free to rotate over a limited range about a substantially vertical axis. The movable supports lift the objects in their initial orientation, rotate through 90° guided by guide members as they are lifted by the chain, and transfer the glass tubes to another conveyor, moving parallel to the production line, in their new orientation transverse the direction of movement of the conveyor.

3,670,867

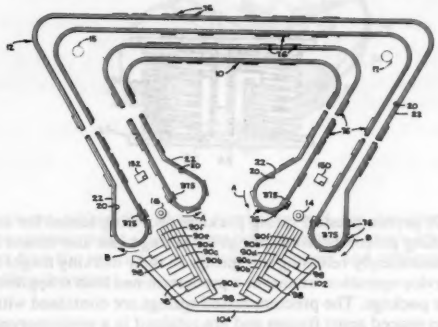
CONVEYOR SYSTEM

Robert J. Traube, San Mateo, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 754,443, Aug. 21, 1968. This application Nov. 17, 1969, Ser. No. 871,298

Int. Cl. B65g *47/00*; E04h *3/04*

U.S. Cl. 198—38 5 Claims



A storage and retrieval system for goods has two power operated conveyors movable in separate endless loops past two (or more) spaced apart picking stations, each picking station common to both conveyors. Each conveyor has bins with compartments in which goods are stored. Although the bins on each conveyor remain in the same sequence, the bins are movable relative to each other on the conveyor to define "buffer" zones which permit simultaneous picking by two spaced apart pickers. The control system for the conveyors includes a reader which receives digital data concerning a group of orders to be picked from a stack of cards, each card giving the identity, quantity and distribution of one of the articles to be picked. The two conveyors are automatically stopped alternately with the bins containing ordered goods at the picking stations, and the operator at each picking station picks goods from the bins in accordance with a read-out unit which displays the card data. A plurality of packing lanes originate at each picking station and terminate at a plurality of packing stations. Each picker distributes goods to the separate packing lanes in accordance with the read-out unit at the picking station.

3,670,868

MAGNETIC CONVEYOR SYSTEM

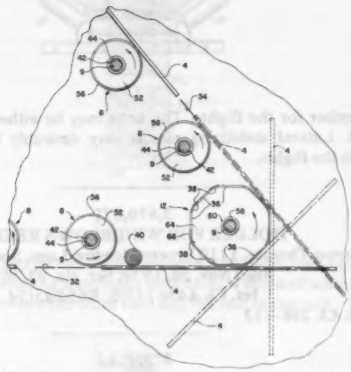
Oliver W. Gnage, and Gordon F. Connelly, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 6, 1970, Ser. No. 52,153

Int. Cl. B65g *47/00*

U.S. Cl. 198—41 6 Claims

A magnetic conveyor system is provided for transporting flat elements or plates such as electrophotographic plates or chips which comprise a photoconductive sheet on a conductive backing. This is accomplished by the use of magnetic rollers each of which includes a bar magnet rotatable on a nonmagnetic shaft and having poles at opposite ends thereof to which is attached a pole piece. These pole pieces each have a larger diameter than the magnet to form a groove between the magnet and the pole pieces. This groove is filled with a nonconductive ring or annulus which extends outwardly beyond the edges of the pole pieces to provide a tire or friction bearing surface for the plates or elements to be transported thereby. The plates can be moved from an approach plane to an exit plane by means of a polygonal-shaped roller which is provided at the intersection of the planes and which has alternating flats and ridges so that when an advancing plate engages a polygonal roller and has passed the last round roller in the approach plane it will be rotated with the polygonal roller due to attraction to one of the flats to the exit plane and be fed forwardly by the round rollers in the exit plane. To assure that the plate separates from the last round roller in the approach plane, a stripper bar is provided between the last roller and the polygonal roller which prevents the trailing end of the plate from following the last roller around. Alternatively, the entire roller can be encapsulated in a nonmagnetic material.



3,670,869

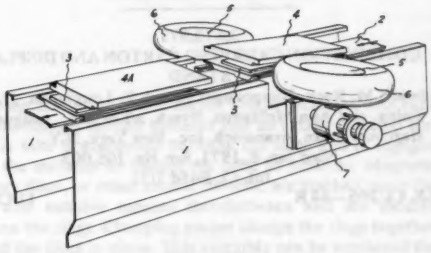
PICKING UP FLAT ARTICLES

Eric P. Dimmock, Parramatta, New South Wales, Australia, assignor to Monier Research & Development Pty. Ltd., New South Wales, Australia

Filed July 29, 1970, Ser. No. 59,300

Int. Cl. B65g *15/30*

U.S. Cl. 198—185 3 Claims



To facilitate the manual removal of flat articles from a conveyor two pneumatic rubber tired wheels are provided, one each side of the conveyor which are freely rotatably about parallel axes which are inclined relative to the conveyor. Flat articles travelling between the wheels are engaged thereby and tilted to lift the leading edge of the flat article from the conveyor.

3,670,870

CONVEYOR BELT STRUCTURE

Edward E. Cheek, Cleveland Heights, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio

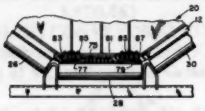
Filed March 15, 1971, Ser. No. 124,032

Int. Cl. B65g *15/30*, *65/28*

U.S. Cl. 198—193 9 Claims

There is provided an endless belt for use in an apparatus capable of performing the operations of stacking and reclaim-

ing bulk material and characterized by a wire cable-reinforced rubber belt having upstanding rigid flights anchored thereto in a manner to utilize the wire cable as a supporting and securing



member for the flights. The belts may be either troughed or flat. Lateral stabilizing means may desirably be associated with the flights.

3,670,871

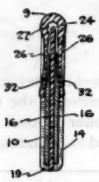
HOLDER FOR WINDBLOWN REEDS

Thomas Thomas, 1110 Breezy Meadow Lane, Spencer, Iowa

Filed Nov. 30, 1970, Ser. No. 93,757

Int. Cl. A45c *11/00*; **B65d** *85/54*

U.S. Cl. 206—13 **5 Claims**



The holder has a flat, rectangular base and a removable clip to slip over one end of the base. The base contains a floor bounded by sidewalls forming channels on both sides of the floor. A partition extends about one-half the length of the floor and separates one end of the channels into pockets for the reeds. The clip has flat wings which slip over the other end of the channels and press down on the wedge-shaped ends of the reeds.

3,670,872

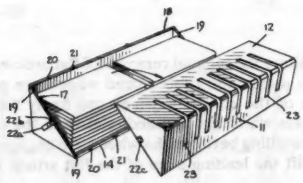
COMBINATION CARRYING CARTON AND DISPLAY STAND

Edward M. Rock, Hauppauge; Joseph F. Loughman, Jr., Ossining, and Ann McManus, Nyack, all of N.Y., assignors to Harcourt Brace Jovanovich, Inc., New York, N.Y.

Filed Jan. 8, 1971, Ser. No. 105,002

Int. Cl. B65d *5/52*

U.S. Cl. 206—44 R **11 Claims**



A fully enclosed carton, preferably of an elongated rectangular configuration, is parted along the end panel diagonal so as to allow the carton to be divided into triangular halves. At least one of the triangular halves includes a plurality of slots disposed along the apex thereof, with the slots being spaced from one another so that books or like material may be displayed therein when the half is disposed on its unslotted leg. The carton is preferably of a size adapted to house a quantity of books approximately equal to those which may be displayed in either one or both of the triangular halves.

3,670,873

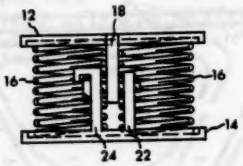
PRECOMPRESSED SPRING PACKAGE

Howard I. Dwyer, Jr., Glen Ellyn, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Aug. 31, 1970, Ser. No. 68,437

Int. Cl. B65d *85/08*

U.S. Cl. 206—46 H **3 Claims**



A precompressed spring package providing means for containing precompressed springs for storage and also means for automatically releasing the springs to their working height for service operation whenever a predetermined load is applied to the package. The precompressed springs are contained within two spaced apart frames and are retained in a precompressed condition by means of a retaining pin which is automatically released whenever a predetermined load is applied to the spring package. The retaining pin may be automatically released by means of gravity or by means of an ejector spring.

3,670,874

METHOD FOR IRRADIATING FOODSTUFFS AND OTHER CONSUMABLES, PHARMACEUTICALS AND THE LIKE, AND A PACKAGE FOR SAME

Alfred Brunner, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Dec. 2, 1969, Ser. No. 881,444

Claims priority, application Switzerland, Dec. 5, 1968, 18161/68

Int. Cl. B65d *81/18, 85/00*

U.S. Cl. 206—46 PV **11 Claims**

The material to be irradiated is placed with an oxygen binding medium into a gas-tight package and irradiated. The oxygen which may be present in the package becomes bound by the oxygen binding medium so that the irradiated material and/or the material of the package do not become adversely effected by the oxygen.

3,670,875

TAPE REEL CONTAINER

Charles E. Jones, Evanston, Ill., assignor to Charles E. Jones and Associates, Inc., Lincolnwood, Ill.

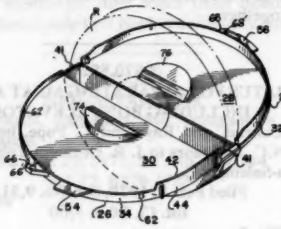
Filed May 25, 1970, Ser. No. 40,158

Int. Cl. B65d *43/16, 85/67*

U.S. Cl. 206—52 F **10 Claims**

A cylindrical storage container for a film or tape reel which is formed of injection molded plastic material and which has a shape conforming to the shape of the reel, with a bottom forming body section and a two part top cover section, the two

members constituting the cover section being hinged along parallel top edges of the side walls of the body section and having overlapping portions forming a dust barrier when held closed by integral latch elements. The reel is held against



movement within the closed container and the container, when opened, may be held in one hand leaving the user's other hand free for removing or inserting the reel and otherwise handling the same.

3,670,876

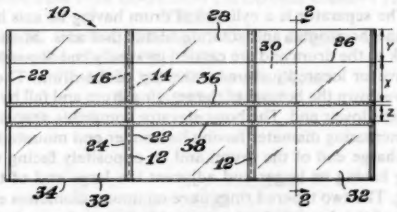
BAG CLOSURE MEANS

Chester P. Davis, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 1, 1970, Ser. No. 42,300

Int. Cl. B65d *85/67, 27/10, 27/16*

U.S. Cl. 206—58 **3 Claims**



A bag for household use including an improved closure comprising a plurality of pressure adhesive strips located in spaced apart relationship on an exterior portion of the bag, and preferably extending in parallel across the entire width thereof. An offset flap portion is adapted to be folded over and attached to one or more of the adhesive strips to tightly close the bag. Accompanying closure, the bag size can be automatically adjusted to better accommodate the size of the article being packaged therewithin. Additionally, a connected series of such bags can be tightly wound on a roll and "tacked" together by the adhesive. The resultant roll is of a firm not easily disarranged character, and remains neat and in register along the ends thereof until the last bag is used.

3,670,877

PACKAGING COILS

Geoffrey Ronald Reed, London, England, assignor to The British Iron and Steel Research Association, London, England

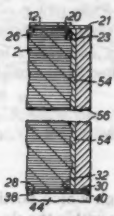
Filed April 16, 1970, Ser. No. 29,177

Claims priority, application England, May 1, 1969, 2,275/69

Int. Cl. B65d *85/66*

U.S. Cl. 206—59 F **9 Claims**

A coil of strip steel is packaged for export by wrapping protective material around the outer circumference of the coil with an overhanging projection around the outer circumferential edge at each end of the coil. A tube slightly longer than the coil is inserted through the eye of the coil and then the ends of the coil are sprayed with polyurethane rigid setting foam. The overhanging projections around the outer circumferential edge are provided by unwinding the outer turn of the coil and then winding it on again with narrow strips of material interposed between the outer turn and the rest of the coil.



3,670,878

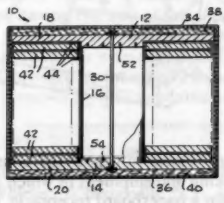
APPARATUS FOR SHIPMENT AND STORAGE OF MAGNETIC MEMORY DISCS AND THE LIKE

Martin W. Seiler, 4501 South Santa Fe Avenue, Los Angeles, Calif.

Filed May 11, 1970, Ser. No. 36,248

Int. Cl. B65d *71/00, 85/30*

U.S. Cl. 206—62 P **15 Claims**



The apparatus has a tube anchor ring at each end, with each ring providing a radially directed and an axially directed surface. A tube is positioned between the rings and is engaged upon the surfaces to anchor the tube in position. Magnetic memory discs, or other similar devices, are stacked upon the tube with suitable spacers therebetween and are located between the rings. Clamping means clamps the rings together to hold the discs in place. This assembly can be employed for storage of the discs and can be packed in a carton for shipment thereof. When employed in a carton, the tube anchor rings are preferably secured to ends which are of such dimension as to engage the sides of the carton. Rubberized hair felt or similar shock-absorbing material can be packed within the carton against the ends.

3,670,879

PACKAGE SLEEVE

Elwood C. Williard, and Barbara Ann Williard, both of P.O. Box 75, Klingerstown, Pa.

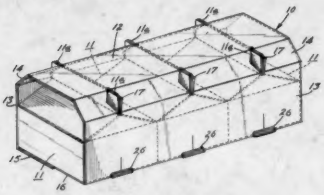
Filed May 15, 1970, Ser. No. 37,688

Int. Cl. B65d *75/14, 75/06, 5/04*

U.S. Cl. 206—65 D **1 Claim**

A tubular open-ended package sleeve for holding a plurality of cartons in side-by-side relationship consisting of top, bottom and side wall panels and angularly disposed top corner panels interconnecting the top and side wall panels. The

corner panels each have a plurality of equally spaced openings in them corresponding to the plurality of cartons contained



within the sleeve through which portions of the cartons project to retain the cartons within the sleeve.

3,670,880

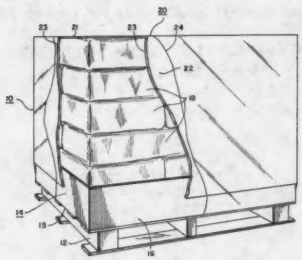
PACKAGE FOR FLEXIBLE PRODUCTS

E. Richard Burleson, Reseda, Calif., and Carl H. Davis, Seattle, Wash., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 7, 1970, Ser. No. 61,881

Int. Cl. B65d *71/00, 85/62*

U.S. Cl. 206—65 S **4 Claims**



This disclosure relates to a package construction adapted for vertical stacking and shipment in which a flexible product is enclosed within a paperboard receptacle, and a paperboard cover is disposed atop the flexible product in such a fashion that the cover rests on the product and telescopes over the receptacle such that other package constructions disposed thereabove bear upon the flexible product and not the paperboard container. The package construction contains a plastic film on its outer surfaces which is shrunk wrapped thereover and is fused thereto, thereby providing weather resistant protection for the contents thereof.

3,670,881

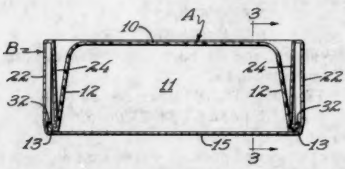
DISPLAY CARTON

Daniel P. Dutcher, North St. Paul, Minn., assignor to Hoerner Waldorf Corporation, Ramsey, Minn.

Filed Jan. 7, 1971, Ser. No. 104,669

Int. Cl. B65d *25/00, 5/26*

U.S. Cl. 206—45.34 **6 Claims**



A tray of plastic or similar relatively rigid material is covered by a paperboard tray which may serve either as the base or cover. A channel-shaped flange projects outwardly from the open end of the plastic tray. The paperboard tray includes side and end walls connected by gusset flaps at the corners. The corners of the gusset flaps adjoining the base panel of the paperboard tray are cut away to provide abutments which engage the corners of the plastic tray flange to lock the two trays together.

3,670,882

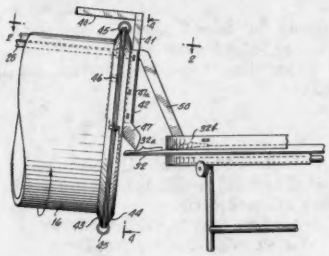
APPARATUS FOR SEPARATING MEAT AND BONES INCLUDING BONE ELEVATOR

Lucas J. Conrad, and Raymond C. Pope, both of Winston-Salem, N.C., assignors to J. R. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 9, 1970, Ser. No. 9,513

Int. Cl. B03b *9/00*

U.S. Cl. 209—2 **12 Claims**



The separator is a cylindrical drum having its axis inclined to the horizontal and rotating about that axis. Meat pieces stick to the drum and are carried upwardly and deposited on a conveyor located just under the top of the drum. The bones move down the bottom of the rotating drum and fall by gravity out the lower end. The bone elevator comprises a tapered ring of increasing diameter having its smaller end mounted on the discharge end of the drum, and an oppositely facing tapered ring having its larger end adjacent the large end of the first ring. The two tapered rings have minimum diameters equal to that of the drum and are mounted in face-to-face relation and spaced apart, so as to form a V-shaped valley open at the bottom. The discharged bones fall into this groove and are trapped between the two tapered rings. They are carried up by their engagement between the rings for at least one-quarter turn of the drum. As they pass beyond that point, they either fall out of the valley or are knocked out by a stationary finger which projects into the valley. A discharge chute has a vertical portion located in alignment with the valley in the upper part of the rising side of the drum and open at the side facing the valley. The lower end of the vertical portion of the chute opens into a diagonal portion which catches the falling bones and directs them onto an inspection table. A shield mounted on the under side of the chute prevents bones from falling out through the lower quadrant of the end of the drum on its rising side.

3,670,883

METHOD FOR CONCENTRATING SLIMED MINERALS

Samuel R. Weir, Long Branch, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Woodbridge, N.J.

Filed Feb. 18, 1969, Ser. No. 800,281

Int. Cl. B03b *1/04;* **B03d** *1/00*

U.S. Cl. 209—5 **7 Claims**

To concentrate constituents of a mixture of slimed minerals, the mixture is formed into a well-deflocculated aqueous pulp. One (or more) of the constituents is selectively filmed with a hydrophobic coating and flocculated by intensively agitating the deflocculated pulp with a suitable selective polar-nonpolar reagent. The pulp is then allowed to settle under quiescent

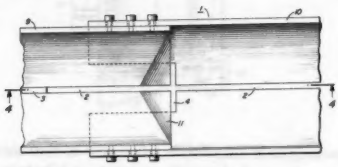
conditions (i.e., without aeration or intensive agitation). The flocculated hydrophobic particles rise and float on the surface of the deflocculated slip as loosely-bonded agglomerates. The deflocculated slip is separated from the floated matter. Separation may be carried out at higher pulp solids and with less expensive equipment than when froth flotation is employed with a slimed pulp that has been similarly conditioned.

3,670,884

NAIL SEPARATOR

Taras I. Charchalis, Baltimore, Md., assignor to Bethlehem Steel Corporation

Filed Jan. 21, 1971, Ser. No. 106,764
Int. Cl. B07b *13/04*
U.S. Cl. 209—80 **4 Claims**



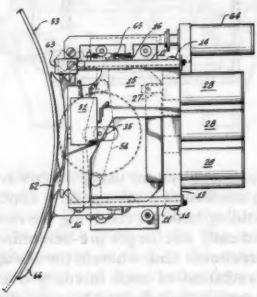
Apparatus to separate nails or similar headed articles into groups in accordance with their length.

3,670,885

SELECTOR FOR EDGE NOTCH CODED CARD-TYPE ITEMS

Norman E. Harlow, Mireleste, Calif., assignor to Image Systems, Inc., Culver City, Calif.

Filed Nov. 19, 1970, Ser. No. 91,064
Int. Cl. B07g *5/3444*
U.S. Cl. 209—80.5 **8 Claims**



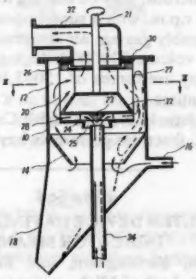
A selector for edge notch coded card-type items comprising a plurality of parallel, spaced pairs of plates movable oppositely into projected and retracted positions and, in projected position, cooperating to address a desired card-type item in a store presenting edge notches to the address plates. Magnet means, which may be rotatably mounted, cooperates with magnetic means on the coded edges of the items tending to draw the items forwardly from the store, with all but the addressed item prevented from moving forwardly by the engagement of their edges with the edges of projected address plates. Solenoid operators and spring means cooperate in the opposite movements of the paired address plates of the selector which are interconnected for simultaneous opposite movement by a lever for each pair engaged adjacent each end with one plate of the pair and having a relatively fixed pivotal axis intermediate its ends about which it rotates to effect the opposite movements of the plates in the pair. The end engagements of the lever may be through pin and slot connections to provide for rectilinear movement of the address plates while the lever rotates about its axis.

3,670,886

POWDER CLASSIFIER

Masuo Hosokawa; Tohei Yokoyama, and Fumio Nakagawa, all of Osaka, Japan, assignors to Hosokawa Funtaikogaku Kenkyusho, Osaka, Japan

Filed Aug. 5, 1970, Ser. No. 61,223
Int. Cl. B07b *7/083*
U.S. Cl. 209—139 A **4 Claims**



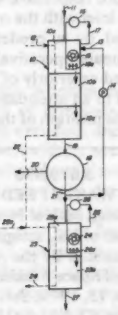
A powder classifier having a housing, a rotary member within the housing having two sets of fins separated by a conical member and means for supplying powder to be classified into the bottom of said rotor whereby certain particles will be carried upwardly through the rotor and exhausted while other particles will fall downwardly into a suitable hopper.

3,670,887

AEROBIC DIGESTION OF SLUDGE WITH OXYGEN

John Ruben McWhirter, Williamsville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 838,499, July 2, 1969, Pat. No. 3,547,814, and Ser. No. 838,500, July 2, 1969, Pat. No. 3,547,815. This application Dec. 14, 1970, Ser. No. 97,706
Int. Cl. C02c *1/06*
U.S. Cl. 210—5 **11 Claims**



BOD-containing water such as sewage is aerated with oxygen and unrecycled sludge is digested with unconsumed oxygen from the aeration.

3,670,888
METHOD OF SEPARATION OF WAX FROM OIL

Raymond Milton Boroughs, Walton-on-Thames, and John Wilson Redman, Horsham, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Dec. 30, 1970, Ser. No. 102,985

Claims priority, application Great Britain, Jan. 7, 1970, 795/70

Int. Cl. B01d 21/26

U.S. Cl. 210—71 7 Claims

Wax is separated from a wax-oil mixture by centrifuging at a temperature below 30° C. and below the pour point of the mixture, by first of all agitating the mixture to render it mobile. The agitation, which should not reduce the wax crystal size below 50 microns, may be stirring for e.g. 1–120 minutes at e.g. 50–1000 r.p.m. with a superimposed beating or whisking set in. Preferably gas e.g. air is entrained with a 5–20 percent increase in volume. The centrifuging, preferably filtration centrifuging, may use forces of 150–3,500 G and times of 5 seconds – 15 minutes.

Preferred feedstocks are 250°–550° C. petroleum fractions, the 450°–550° C. fractions preferably having a gas oil diluent.

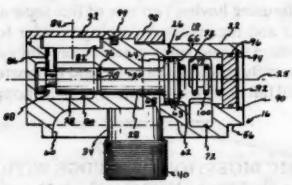
3,670,889
FLUID FILTER DEVICE HAVING BYPASS AND INDICATOR MEANS

Carl A. Brown, Birmingham, and Frederick L. Walter, Orchard Lake, both of Mich., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed June 1, 1970, Ser. No. 42,030

Int. Cl. B01d 27/10

U.S. Cl. 210—90 1 Claim



A fluid filter device of the type wherein a portion of the housing containing the filter element is adapted to be spun off from a cap member and to be disposed of with the filter element. The cap member is provided along with an inlet and an outlet respectively in fluid communication with the exterior and interior of the filter element for filtering fluid passing therethrough. A pressure responsive bypass valve is operable to directly connect the inlet with the outlet when the filter element becomes clogged by a predetermined amount. The bypass valve includes means operatively connecting it to an indicating means mounted exteriorly of the filter device to provide a visual indication to an attendant of the condition of the filtering element and the position of the bypass valve.

3,670,890
LIQUID WASTE FEED SYSTEM

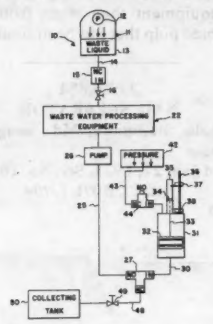
John B. Hall, Jr.; Yi Tung, both of Newport News, and Lavern E. Winn, Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Jan. 15, 1970, Ser. No. 3,151

Int. Cl. B01d 43/00

U.S. Cl. 210—104 9 Claims

A pressurized liquid waste tank feeds liquid waste into liquid waste processing equipment. The processed liquid is pumped into an accumulator tank which has an actuator that opens and closes microswitches as the accumulator tank is filled and emptied. These microswitches control solenoid valves which are located in the lines feeding the liquid waste processing equipment, the accumulator tank and the collecting tank. An electrical circuit ties together the switches and



valves in a manner such that sufficient waste liquid is automatically maintained in the liquid waste processing equipment to give optimum system performance in a zero gravity environment.

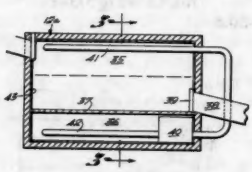
3,670,891
MICROWAVE SEWAGE TREATMENT SYSTEM

Wallace Peyton Allen, 1447 N.W. 36th Street, Miami, Fla.

Filed May 4, 1970, Ser. No. 34,279

Int. Cl. B01d 21/24

U.S. Cl. 210—128 3 Claims



A sewage treatment system using microwave electromagnetic energy to sterilize raw sewage on a continuous basis is described. A holding tank for receiving the raw sewage at an inlet port periodically discharges pre-determined amounts of sewage into a treatment tank wherein the sewage is subjected to microwave radiation of such intensity over a pre-determined time interval as will destroy bacteria not only by heat induced in the raw sewage but also by the oscillatory effects of the radiation on the organisms.

3,670,892
REVERSE OSMOSIS APPARATUS

William Baerg, 1992 Lemnos Drive, Costa Mesa, Calif., and Pierre St. Guilhem Humber, 338 Reims Lane, Costa Mesa, Calif.

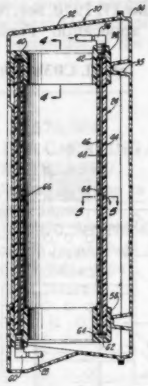
Filed Nov. 6, 1969, Ser. No. 874,641

Int. Cl. B01d 39/18, 31/00

U.S. Cl. 210—134 13 Claims

A reverse osmosis unit in which the membrane has a supported side and an unsupported side, with a liquid product reservoir in communication with the supported side, and a feed liquid chamber in contact with the unsupported side. The unit includes means to maintain the pressure of the feed liquid at a sufficiently high level to prevent the flow of liquid through

the membrane from the supported side to the unsupported side when the inlet to the feel liquid chamber is closed. A

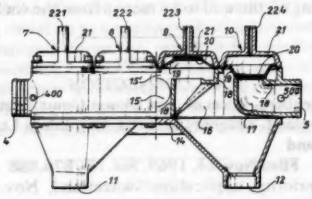


reverse osmosis unit in which the membrane is supported by a porous layer material containing activated charcoal.

3,670,893
CONTROL ARRANGEMENT FOR A SWIMMING POOL FILTER

Volker Seid, Heilbronn, Germany, assignor to Cillichemie Ernst Vogelmann, Heilbronn, Germany

Filed Feb. 3, 1971, Ser. No. 112,315
Claims priority, application Germany, April 23, 1970, P 20 19 691.2
Int. Cl. B01d *37/00*
U.S. Cl. 210—138 **10 Claims**



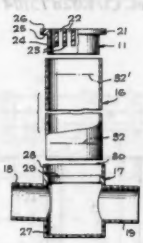
The control arrangement for a swimming pool filter includes two pairs of control valves, the discharge port of the first valve in each pair being coupled to the intake port of the second valve. The intake ports of the first valves are connected by a high-pressure conduit to the output end of the filter pump whose input end draws water from the pool. Two low-pressure conduits connect the discharge ports of the second valves to the pool and to a waste line respectively. The filter is connected by by-pass lines to the coupled ports between the valves in each pair. A single operating mechanism is connected to all valves and operates the same in timed sequence in which the valves direct water flow from the pump either through the filter in a first direction to the pool, or through the filter in the opposite direction to a waste line, or ultimately directly from the pool to the waste line.

3,670,894
GROUND SURFACE DRAINAGE APPARATUS

Edward L. Friedl, 14751 Bessemer Street, Los Angeles, Calif.

Filed Jan. 19, 1970, Ser. No. 4,153
Int. Cl. E03f *1/00*
U.S. Cl. 210—164 **4 Claims**

In the ground surface drainage apparatus, a monolithic catch basin has a side outlet from which drain water can flow. The catch basin is tubular, with an open top. Interiorly of the catch basin, below the open top, is a stop. A vertical extension pipe of selectable length is inserted into the catch basin down

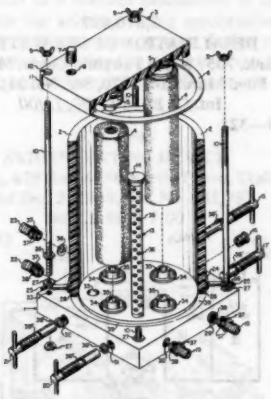


to the stop and extends up to near the ground surface. A grate rests in the top of the upright extension. All parts preferably are made of synthetic polymer composition material.

3,670,895
FLUID FLOW CONTROL APPARATUS FOR FILTER UNITS IN A FILTRATION SYSTEM

Kenneth Wayne Goodpasture, c/o Dixon Industrial Park, Dixon, Ill.

Filed July 29, 1970, Ser. No. 59,108
Int. Cl. B01d *29/38*
U.S. Cl. 210—167 **7 Claims**



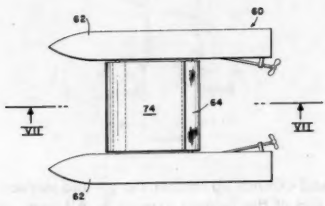
A unitary filtering device, wherein the mounting base contains an internal network of interconnected ducts having a first inlet duct and a first exit duct and a plurality of access holes each connected therewith, a second inlet duct and a second exit duct, and a valve channel individual to each of the first and second inlet and exit ducts. Anchor bolts are secured to the base and engaged by a clamp, gripping the outer surface of a hollow cylinder near one end, for sealing the one end against the base, in such a position that the access holes are surrounded thereby. A plurality of hollow tubular filter elements are each mounted at one end over a corresponding one of the access holes, with a top cover positioned over the other end of the cylinder and engaged by the anchor bolts for sealing the other end of the cylinder thereto. Plug-ended valve stems are mounted within each valve channel and are movable in longitudinal directions to either of two predetermined positions therein for establishing either a filtering route or a backwashing route within the device.

3,670,896

APPARATUS FOR REMOVING OIL FROM A BODY OF WATER

Frank E. Hale, Jr., 1638 Santa Barbara Street, and Frank E. Hale, Sr., 4005 Santa Cruz Avenue, both of San Diego, Calif.

Filed Jan. 22, 1971, Ser. No. 108,839
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 2 Claims



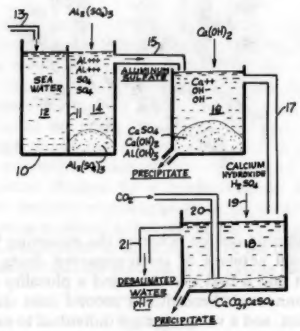
Apparatus and method for removing a liquid hydrocarbon material, such as oil, from a water surface wherein the apparatus includes a collection surface which is moved into and out of the water, the collection surface being made of a material including a high molecular weight solid hydrocarbon which is wettable with oil so that when the surface emerges from the water the oil collected by adsorption is wiped from the surface and collected.

3,670,897

DESALINATION OF SEA WATER

Bruce S. Frank, 7057 North Fairchild Circle, Milwaukee, Wis.

Filed March 20, 1970, Ser. No. 21,301
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—321 4 Claims



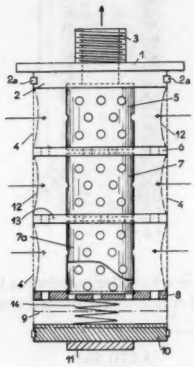
Desalination of sea water is accomplished by use of osmosis wherein there is a saline water chamber and a chamber having a concentrated solution of an intermediate or precipitable soluble salt, such as aluminum sulfate, the chambers being separated by a semipermeable membrane. Fresh water will pass from the saline or sea water to the salt solution without use of pressure. The excess concentrated salt solution in the second chamber passes to a third chamber or place where salt is removed by being brought into contact with a precipitant such as calcium hydroxide in the case of aluminum sulfate.

3,670,898

FILTER HAVING A FLEXIBLE WALL FOR FILTERING LIQUIDS

Eugene Fournier, 84 Chateauneuf De Gadagne, France

Filed June 17, 1970, Ser. No. 47,100
Claims priority, application France, June 20, 1969, 6920776
Int. Cl. C03b *3/00*
U.S. Cl. 210—356 6 Claims



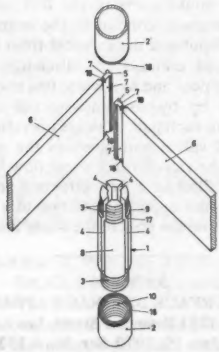
An apparatus for filtering a fluid medium, for example, dirty swimming pool water, comprises a hollow filter sleeve having a flexible wall which wall is caused to deform by the pressure of fluid medium flowing through the wall. The end of the sleeve is attached to a member which on reduction of the pressure of the fluid flowing through the wall causes the wall to straighten and assume its original position thereby causing debris resting on the wall to be moved from the wall.

3,670,899

RAIL CONNECTION

Hans Kronenberg, Lucerne, and Dionys Gmur, Wetzikon, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 14, 1969, Ser. No. 876,888
Claims priority, application Switzerland, Nov. 15, 1968, 17212/68
Int. Cl. A47f *5/00*; F16b *7/04*
U.S. Cl. 211—182 4 Claims



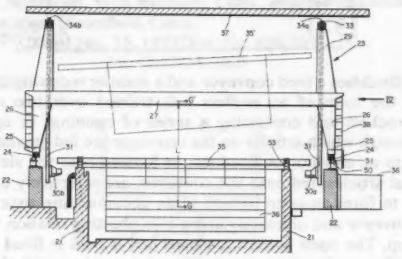
A rail connection arrangement comprising a rail, a support arranged substantially perpendicularly to the rail and comprising a holding device provided with slot means and an exterior

thread, the support also comprising a spacer with a portion having an interior thread engaged by said exterior thread, the rail being received in the slot means and fixedly held therein between the holding device and the spacer, the portion of the spacer having the interior thread is made of a material which is harder than that of the remainder of the parts in the above combination.

3,670,900
LOW-DECK TRUCK FOR CARRYING AN ARTICLE TO BE TREATED

Riyokichi Ito, Tokyo, Japan, assignor to Katsukawa Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 4, 1970, Ser. No. 43,540
Claims priority, application Japan, Feb. 17, 1970, 45/13694
Int. Cl. B66c *5/04*
U.S. Cl. 212—14 **1 Claim**

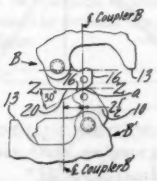


A low-deck truck for carrying an article to be treated during the treating process, adapted so as to raise the article from a liquid treating vessel as being in slanted position for dropping off the liquid therefrom at least in some part of its travel from the treating vessel up to a predetermined uppermost position. A pair of tapered drums are provided for winding up two ropes, respectively, which ropes have a pair of brackets secured to the lower ends thereof so as to be engageable with a carrier bar holding the article. The two tapered drums are so actuated as to wind the two ropes at different speeds.

3,670,901
CAR COUPLER

William J. Metzger, East Cleveland, Ohio, assignor to Midland-Ross, Cleveland, Ohio

Filed Dec. 28, 1970, Ser. No. 101,979
Int. Cl. B61g *3/04*
U.S. Cl. 213—151 **9 Claims**

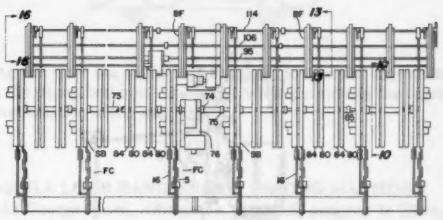


A railway car coupler of the knuckle type in which the contour of knuckle is modified so as to increase the gathering range of the coupler especially during knuckle-to-knuckle engagement between the couplers as they come together for coupling from positions in which they are displaced laterally of the longitudinal center line of the car.

3,670,902
BAR UNSCRAMBLER

Irving Leonard Kaplan, Cleveland Heights, Ohio, assignor to Carl Krasny & Associates, Inc., Cleveland, Ohio

Filed Nov. 19, 1969, Ser. No. 878,132
Int. Cl. B23q *5/22*
U.S. Cl. 214—1 P **6 Claims**

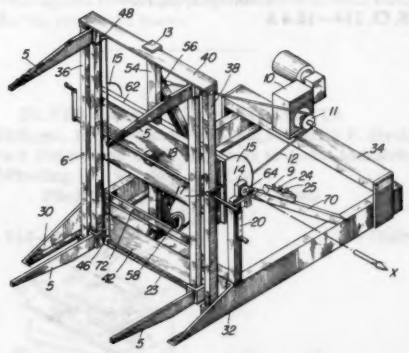


A bar unscrambler is provided consisting of feed cradles, shuffle bed modules, and bar feeder units, which are so arranged as to effectively and progressively unscramble or separate bars and the like from a bundle of bars and from each other. The feed cradles are provided with elements having a walking beam type of movement. The shuffle bed modules comprise mainly walking and fixed beam components, the walking beam components functioning also to activate the aforesaid feed cradle elements. The bar feeders have incorporated therein bar stops effective to temporarily restrain movement of the unscrambled bars, and have also incorporated therein bar selectors designed to individually move the restrained bars to a transfer mechanism or the like, the movements of the bar selectors being synchronized to avoid interference with the bars as they move to the bar stops. Provision is also made for adjusting the position of the bar stops to accommodate bars of different sizes or dimensions.

3,670,903
SKID INVERTING DEVICE

Otis L. Hamilton, 425 East 4450 North, Provo, Utah

Filed Dec. 3, 1969, Ser. No. 881,757
Int. Cl. B65g *7/00*
U.S. Cl. 214—1 Q **11 Claims**

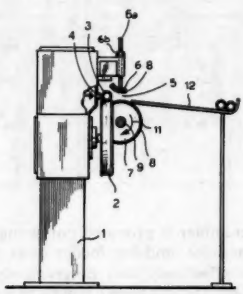


A device for inverting a generally planar object which comprises a means for holding said object on its upper plane and its lower plane, means for tilting said object about a fixed axis so that said planes are generally vertical, said object and said holding means being rotatable about the vertical axis of said object 180° and means for re-tilting said object so that said object returns inverted to its original position.

3,670,904
APPARATUS FOR COLLECTING GLASS TUBES AT THE END OF A PRODUCTION

Vanfrido Olivotto, Via Carlo Capelli 85, Turin, Italy

Filed Feb. 17, 1971, Ser. No. 116,017
Claims priority, application Italy, March 23, 1970, 67984 A/70
Int. Cl. B65g 47/74
U.S. Cl. 214—1 P 4 Claims

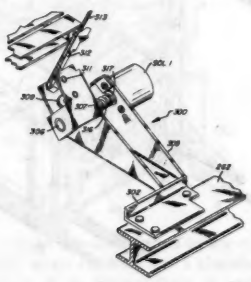


A glass tube production line in which glass tube sections are conveyed lengthwise along a conveyor at high speed is provided with frictional braking means for annulling the lengthwise speed of each tube section, permitting collection of the latter on a surface at one side of the conveyor. The braking is effected by ejecting the glass tube sections laterally from the conveyor so that they enter transverse passages defined between respective pairs of braking elements, each passage tapering in width so that each tube section is braked by contact with surfaces of friction material on the braking elements as it passes through said passages.

3,670,905
OBSTRUCTION DETECTION MEANS FOR MATERIAL HANDLING DEVICE

Arthur R. Burch, Plainwell, and Charles E. Bates, Battle Creek, both of Mich., assignors to Clark Equipment Company

Division of Ser. No. 543,229, April 18, 1966, Pat. No. 3,536,209. This application July 23, 1970, Ser. No. 57,747
Int. Cl. B65g 1/06
U.S. Cl. 214—16.4 A 1 Claim

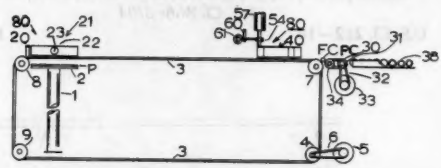


An obstruction detecting device is disclosed for material handling systems such as an automatic storage system wherein a stacker vehicle with a lateral platform is utilized to transfer material units between the vehicle and a selected storage bin. Probe means are mounted adjacent the lateral platform and a probe element is adapted to move through a portion of the selected bin to detect the presence of an obstruction in the bin. The probe element includes an actuator which causes pivotal motion thereof in response to positioning of the platform in alignment with the bin. The probe means is provided with signal means to disable the power operator for the lateral platform if a material unit or other obstruction is encountered in the bin and to enable the power operator if the bin is empty.

3,670,906
ARTICLE LOADING SYSTEM

Frank H. Miller, Jr., Louisville, and David L. Witherspoon, Anchorage, both of Ky., assignors to Miller Engineering Corporation, Louisville, Ky.

Filed Jan. 14, 1970, Ser. No. 2,777
Int. Cl. B65g 57/24
U.S. Cl. 214—6 P 5 Claims

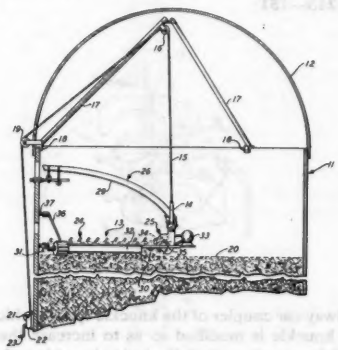


Discloses a feed conveyor and a main or receiving conveyor in the form of an endless belt trained over two or more sprockets and containing a series of openings or apertures through which articles on the conveyor are fed gravitationally onto an elevator. A fixed stop is located over the elevator so that articles, fed onto the conveyor, are selectively turned so as to form an open pattern in an accumulating zone on said conveyor and ultimately come into abutting relation with the stop. The open pattern is closed and is held in fixed position until one of said apertures comes into registry with the elevator below the fixed stop so that the layer or pattern of articles held in said position pass gravitationally through said aperture onto a pallet on said elevator platform. A unique control system involves the use of an auxilliary control conveyor driven in synchronism with the main conveyor and which contains actuating members in the form of cams judiciously placed so as to actuate control members, such as limit switches or pneumatic valves to perform specific functions at specific points on said conveyor.

3,670,907
SILO UNLOADER

James H. Downing, Mineral, Va., assignor to Harris Company, Inc., Mineral, Va.

Filed April 30, 1970, Ser. No. 33,298
Int. Cl. B65g 65/38
U.S. Cl. 214—17 DB 16 Claims



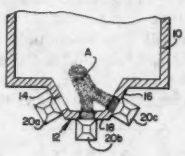
A leveling device for the wheel-driven frame of a silo unloader which encloses means for transporting ensilage over

which it travels, the inner end of which is supported at about the silo center and the outer end of which is rotatable thereabout near the silo wall, comprising means for raising or lowering said outer end depending upon the angle the frame makes with the wall of the silo, said means comprising a wall-engaging wheel, a first arm on which said wheel is mounted to position it at a selected location above the frame, a shaft pivoted in said frame and to which said arm is rigidly connected, a second arm rigidly connected to said shaft, generally parallel to the frame and shorter than the first arm, a bar extending through a slot in and at approximately right angles to the frame to move up and down therein, means pivotally connecting the free end of said second arm to said bar, and means connecting the ends of said bar to the respective unloader driving wheels, so that as the wall wheel moves up or down along said wall it simultaneously effects lowering or raising of the frame outer end with respect to said driving wheels.

3,670,908
GLASS FURNACE WITH TRIPLE BATCH CHARGING AND METHOD

James F. Stevenson, West Hartford, Conn., assignor to Emhart Corporation, Bloomfield, Conn.

Filed Jan. 15, 1971, Ser. No. 106,701
Int. Cl. C03b 3/00
U.S. Cl. 214—24 **9 Claims**



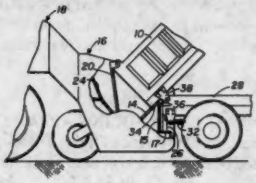
The upstream end of a rectangular glass melting furnace is provided with a doghouse of isosceles trapezoidal shape having three openings through which batch material is introduced in discrete elongated masses, or charges by three batch chargers. Two out of three batch chargers in these openings are operated simultaneously in a predetermined sequence. The two side batch chargers operate along angularly related lines of action which converge with one another at a point also located on the line of action of the center batch charger. During operation of the two angularly related side chargers a composite batch, or mass, is formed so as to travel in a downstream direction in the furnace, and by operation of the center batch charger with one or the other of the two side batch chargers a composite mass or batch is directed angularly outwardly with respect to the downstream direction. Thus, operation of three batch chargers, in pairs, in a sequential fashion, provides a convenient means and method for charging a furnace at a rate double the rate possible with a single charger, or with two chargers operated alternately. Further, the three chargers can be operated in alternate pairs at their respective optimum speeds to provide the desired distribution of batch across the furnace.

3,670,909
AGGREGATE HANDLING METHOD AND SYSTEM

John H. Holland, Norman, Okla., assignor to The J. H. Holland Company

Filed April 6, 1970, Ser. No. 25,681
Int. Cl. B65g 67/02
U.S. Cl. 214—43 **4 Claims**

A method for transferring crushed rock from a dump truck to the hopper of a paving machine without danger of spillage by interlocking the rear end of the dump bed with the upper portion of the hopper when the dump bed is raised into position to dump into the hopper. The hopper is provided with an upwardly extending centrally located bumper which is adapted to engage and push the rear end of the truck frame

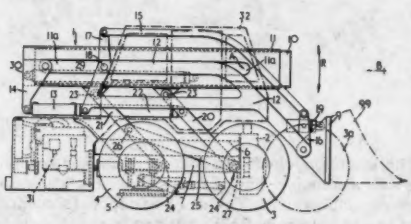


during the time the dump bed is raised to transfer aggregate from the dump bed into the hopper while permitting the truck to pivot relative to the hopper.

3,670,910
MOBILE LOAD HANDLING OR LIFTING MACHINES

Donald George Shaw, Albrighton, England, assignor to Shaw, Trew & Smith Limited, Shifnal, Shropshire, England, a part interest

Filed July 23, 1970, Ser. No. 57,536
Int. Cl. E02f 3/00
U.S. Cl. 214—141 **2 Claims**

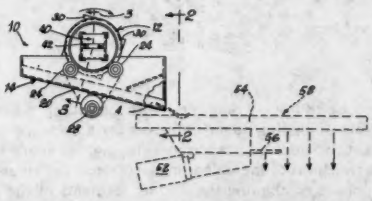


A mobile machine for load handling or lifting purposes is disclosed in which an attachment head, for receiving load handling means attached to it, is carried for raising and lowering movement by forwardly extending parallel motion linkage pivotally connected to a forwardly extendible and rearwardly retractable member of a telescopic boom longitudinally carried by an extendible wheeled chassis of the machine, the boom being also arranged to be bodily advanced or retracted relative to the chassis by support linkage which is linked to the chassis for fore and aft extension of the latter to counteract the machine against forward tipping movement on such bodily advance of the telescopic boom.

3,670,911
SILVERWARE LOADING APPARATUS

Ralph Ettlinger, Jr., Highland Park, and Frederick P. Strobl, Jr., Park Ridge, both of Ill., assignors to Avant Industries, Inc., Wheeling, Ill.

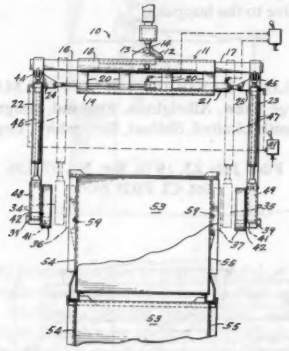
Filed July 31, 1970, Ser. No. 59,940
Int. Cl. B65b 21/02
U.S. Cl. 214—312 **8 Claims**



An apparatus for loading silverware onto an adjacent surface such as a silverware sorting construction. The apparatus

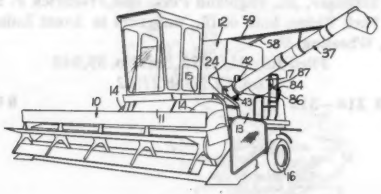
comprises a rotating drum having an opening or openings in its side wall for the passage of silverware out of the drum. A removable receptacle may be located in the drum for loading the drum with silverware. As the drum rotates, the silverware is removed from the drum at a relatively regular rate.

3,670,912
CONTAINER HANDLING APPARATUS
Glenn G. Dunbar, 2608 Overlook Drive, Toledo, Ohio
Filed March 16, 1970, Ser. No. 19,873
Int. Cl. B65g 7/00
U.S. Cl. 214—313 **3 Claims**



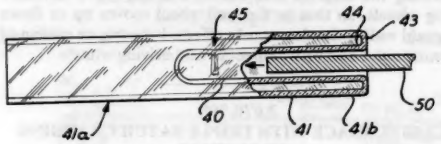
This invention relates to a container handling apparatus for use with a container having opposed geometrically enclosed female members on its sidewalls. Two opposed shoulder members extend outwardly from a support frame. A cylinder and guiding mechanism equally and simultaneously move the shoulder members. A depending arm is attached to each of the shoulder members and a rotatable male engaging member is connected to the distal end of each of the depending arms. The male engaging members have a shape complementary with the enclosed female members and power cylinders are provided for rotating the male engaging members.

3,670,913
BIN UNLOADER BREAK BACK SYSTEM
Robert S. Reaves, Blue Springs, Mo., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed April 19, 1971, Ser. No. 135,304
Int. Cl. B60p 1/42
U.S. Cl. 214—522 **10 Claims**



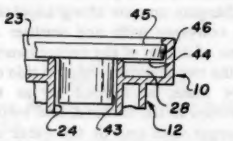
This disclosure is concerned with providing an improved swingable unloading auger conveyer for a combine harvester in that it provides assistance in swinging the auger conveyer from a transport to the unloading position; it provides an automatic means of aligning the driving elements of the auger so that they become properly indexed during the previously mentioned positioning operation; and it provides a safety release in case the unloading conveyer when in unloading position hits some obstruction this safety release being in the nature of a break back brace member having a frictional engagement and with the aforementioned swinging assist functioning as an energy absorbing element during the break back.

3,670,914
BREAK SEAL
Stephen D. Poulsen, Jr., Florham Park, N.J., assignor to Airco, Inc., New York, N.Y.
Filed May 21, 1970, Ser. No. 39,193
Int. Cl. B65d 47/10
U.S. Cl. 215—32 **5 Claims**



This invention relates to an improved form of break seal which is especially adapted to be used as a closure for a container or which may otherwise be used to form a hermetic seal in laboratory equipment. In its preferred form the break seal is fabricated from soft or borosilicate glass and takes the form of an external tube joined to an internal test tube having an indentation in its sidewall. The indentation forms a weak point in the sidewall of the test tube and in the event that the seal is to be broken an actuating device is pressed against the indentation causing a rupture in the sidewall of the glass tube.

3,670,915
MULTI-PURPOSE STOPPER
William E. Forman, 4817 Glendale Avenue, Delta, British Columbia, Canada
Filed Feb. 12, 1971, Ser. No. 114,859
Int. Cl. B65d 41/28
U.S. Cl. 215—48 **10 Claims**

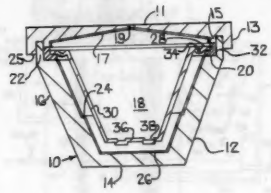


A stopper having a tubular adapter provided with flexible flanges which are deflected into sealing engagement with the side of an opening in a wine jug when the adapter is pressed therein. The tubular adapter will support a fermentation lock in operating position on the jug or, alternatively, a cap is fitted to the adapter in one position to act as a normal closure for the jug and in another inverted position to serve as a combined closure and safety valve.

3,670,916
FOOD CONTAINERIZATION
Arnold L. Alpert, 633 Olmstead Avenue, Bronx County, N.Y.
Filed Feb. 19, 1970, Ser. No. 12,686
Int. Cl. B65d 25/18
U.S. Cl. 220—9 F **9 Claims**

An insulated food container is provided having an outer vessel formed at least in part of heat-resistant material and having sides which terminate in a peripheral rim portion with an inwardly disposed peripheral ledge. An inner vessel adapted to hold the food has a peripheral flange which rests on the ledge of the outer vessel and positions the inner vessel inwardly with

respect to the outer vessel to define an insulating air space therebetween. A protective annular ring fabricated from material of higher heat distortion resistance than the outer vessel is disposed on the peripheral ledge of the outer vessel beneath the flange of the inner vessel. The container is closed



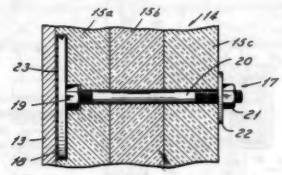
by a lid having suitable means to sealably engage the rim portion of the outer vessel and has a conically shaped portion, the vertex of which is fracturable under high internal pressure to provide relief of the vapor pressure that may accumulate within the container.

3,670,917

STORAGE TANKS FOR ULTRA LOW TEMPERATURE LIQUIDS

Ko Nishimaki, and Isamu Yoshikawa, both of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd.

Filed Nov. 4, 1970, Ser. No. 86,850
Int. Cl. B65d 7/22
U.S. Cl. 220—10 **7 Claims**



Fastening means for attaching a heat-insulating layer to an ultra low temperature liquid storage tank, comprising a fastening member of the same material as the tank and bonded to the outer surface of the tank by a low temperature adhesive thereby substantially preventing stresses from developing in the adhesive layer between the fastening member and the tank as a result of large variations in temperature. A nut is welded to the fastening member and a fastening bolt made of a synthetic resin of low thermal conductivity is studded in the nut. The bolt is used to fasten the heat-insulating layer to the outer surface of the tank, thereby firmly fastening the beat-insulating layer to the tank while satisfactorily suppressing heat transfer between the tank interior and the outside.

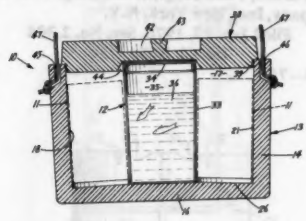
3,670,918

THERMAL CONTAINER ASSEMBLY

Kenneth A. Mitchell, 4704 Stevens Avenue South, Minneapolis, Minn.

Filed Sept. 4, 1970, Ser. No. 69,799
Int. Cl. B65d 1/24
U.S. Cl. 220—20 **21 Claims**

A hexagonal-shaped container having an upright wall formed with inside upright recesses for positioning a plurality of cans or bottles around a member for holding a solid or fluid,



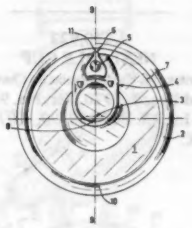
as water or heat sink material. A cover, located over the member, closes the top of the container.

3,670,919

EASY OPENING LID FOR CANS

Gerard Prayer, and Jean-Marie Perrat, both of La Fleche, France, assignors to Cebal GP, Paris, France

Filed Feb. 8, 1971, Ser. No. 113,400
Claims priority, application France, Feb. 27, 1970, 7007117
Int. Cl. B65d 17/24
U.S. Cl. 220—54 **5 Claims**



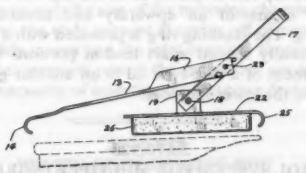
The invention relates to lids known as "easy complete opening lids" in which the tear line is in the form of a circle which is eccentric with respect to the lid.

3,670,920

SEALING DEVICE FOR EASY OPENING CANS

Myles A. Rohrlick, 5 Maume Circle, Hampton, Va.

Filed Dec. 22, 1970, Ser. No. 100,694
Int. Cl. A47j 27/08
U.S. Cl. 220—57 **6 Claims**



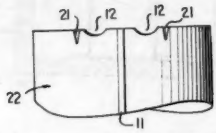
An external sealing device that can be easily manufactured, and provides positive sealing for the openings of previously opened quick opening cans. The device is made to form a lever action so that positive sealing can be achieved.

3,670,921

STRESS RELIEVED CONTAINER AND METHOD OF MAKING SAME

Herbert D. Bartels, Palos Heights, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,304
Int. Cl. B65d 7/34
U.S. Cl. 220—75 **14 Claims**



This disclosure relates to a metal container, and more particularly to a thin walled, metal can having a welded side seam and wherein at least one end thereof is necked-in and then outwardly flanged so as to receive an end of a reduced diameter. In order to prevent edge cracking during the flanging operation adjacent the welded seam, the necked-in edge of the can body is provided with a shallow notch on each side of the welded seam. In addition, in order to prevent wrinkling of the metal in alignment with the notches during the necking-in operation and subsequent fracture along the areas of wrinkling during flanging, the end edge portion of the blank from which the can body is formed is provided with stress relief indentations adjacent the notches.

3,670,922

NESTABLE CUP

Julius Phillips, Bronx, N.Y., assignor to Owens-Illinois, Inc.

Filed Dec. 4, 1970, Ser. No. 95,255
Int. Cl. B65d 21/00, 43/10
U.S. Cl. 220—97 C **3 Claims**

A one-piece nestable cup is provided with a top rim portion which serves as the upper stacking shoulder for supporting a like container nested therein. A lower stacking shoulder having a greater peripheral extent than the minimum peripheral extent of the top rim is spaced from the top rim and is joined thereto by means of an upwardly and inwardly inclined stacking ring. The stacking ring is provided with a plurality of circumferentially spaced apart lead-in portions to facilitate the engagement of a disc-type lid in an annular groove positioned below the lower shoulder.

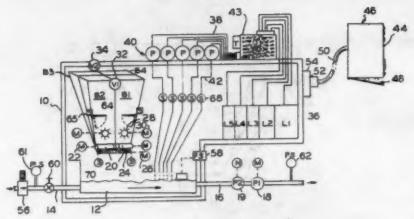
3,670,923

CONTROL SYSTEM FOR MULTIPLE INGREDIENT DISPENSING APPARATUS

Roland J. Hawes, Jr., and Milton P. Daniel, both of Boise, Idaho, assignors to said Hawes, by said Daniel

Filed May 4, 1970, Ser. No. 34,335
Int. Cl. B67d 5/14
U.S. Cl. 222—2 **25 Claims**

A dispensing apparatus meters a plurality of different microingredient feed additive supplements for livestock or poultry simultaneously into a fluent carrier material which conveys the various supplements to a feedmill, a drinking water supply or any other desired point. Each different supplement is stored and metered separately and independently of the others through an electric motor-driven metering device.



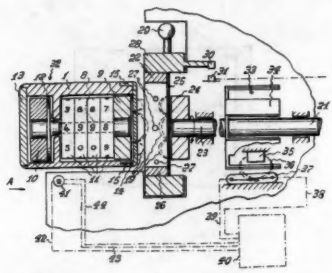
Control and monitoring of the machine operations takes place at a remote control panel and box. Decisions as to what combination of supplements to feed and in what amounts are preprogrammed using prepunched plates inserted over a bank of microswitch plungers at the control box which determine which motors at the machine operate and at what speed.

3,670,924

VENDING SYSTEM USING A VALUE STORING KEY

Theodor Asper, Bergwerkstrasse 37, Horgen, Switzerland

Filed Sept. 1, 1970, Ser. No. 68,660
Claims priority, application Switzerland, Sept. 19, 1969, 14200/69
Int. Cl. G07f 13/00
U.S. Cl. 222—2 **8 Claims**



A self-service system for obtaining vendible products or services in which a release key is used, this key incorporating a tally which is set for the purchase of products or services up to a certain value and also having sensing means to co-operate with a product or service dispenser, so that the tally is devalued according to the value dispensed with the tally indicating goods or service value dispensed, the key being ineffective when the set value is exhausted, the sensing means operating by co-operating permanent magnets between the key and dispenser and pulse producing control means.

3,670,925

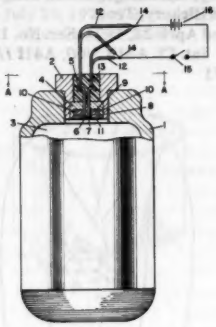
EXPLOSIVELY ACTIVATED GLASS VALVE

Donald A. Moyant, Phoenixville, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

Filed Oct. 28, 1969, Ser. No. 871,923
Int. Cl. B67b 7/00
U.S. Cl. 222—3 **13 Claims**

A valve having an internally stressed, hermetically sealed glass barrier to the passage of fluids. An explosive charge

opens the valve by pulverizing the glass barrier. Three embodiments are disclosed: a charge imbedded in the glass, a



shaped charge directed at the glass, and a charge placed near the edge of the glass outside the conduit for the fluid.

3,670,926

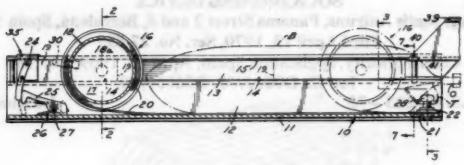
INTRAVENOUS FEEDING APPARATUS

Charles C. Hill, Ann Arbor, Mich., assignor to Power Technology Corporation, Ann Arbor, Mich.

Filed Sept. 11, 1969, Ser. No. 857,151

Int. Cl. B67d 5/22

U.S. Cl. 222—47 **18 Claims**



An intravenous feeding device comprising a base, a drum movable along a track on said base and a constant tension coiled spring having one end thereof fixed to the drum and the other to the base so that when a collapsible container is positioned, the drum acts upon the collapsible container to dispense the contents of the container. A latch is provided for locking the drum with the spring in its extended position and acceleration and position responsive means are provided for locking the drum in the event that the drum is released during loading or in the event that the material is dispensed at excessive speed or in the event that one end of the base is elevated beyond a predetermined angle. Gauge means are provided for indicating the rate at which fluid is dispensed.

3,670,927

METHOD AND MEANS PROVIDING DOSAGES OF ORAL HYGIENIC SUBSTANCE

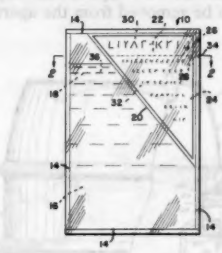
Alan M. Hubbard, 62 Hill Street, Morristown, N.J.

Filed March 25, 1970, Ser. No. 22,557

Int. Cl. B65d 33/38, 77/38

U.S. Cl. 222—107 **1 Claim**

Envelope of supple material, such as plastic, having a sealed chamber confines the substance. The chamber is formed with a narrowing portion, and the envelope has a cut in one side adjacent the narrowing portion to insure a tearing open of the envelope across the narrowing portion. Thus, a restricted pouring nozzle is provided. The envelope has a stiffener therewithin to make it handy to hold during pouring. Also, the



stiffener cooperates with the cut to facilitate a tearing of the envelope across a predetermined line.

3,670,928

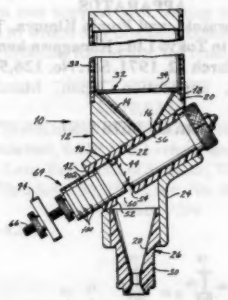
POWDER METERING DEVICE FOR LOADING AMMUNITION

Roy R. Hanson, 155 Cumberland Drive, Maryland Heights, Mo.

Filed Jan. 26, 1970, Ser. No. 5,620

Int. Cl. G01f 11/06

U.S. Cl. 222—288 **28 Claims**



A powder metering device includes a powder reservoir, a pouring conduit below the reservoir and an elongated cylindrical channel between the reservoir and the pouring conduit. Inlet and outlet openings provide communication into the channel from the reservoir and the pouring conduit, respectively. A cylindrical slide having a reduced diameter portion intermediate its length is slidably mounted in the channel. The reduced diameter portion provides a metering chamber for receiving powder from the inlet conduit and for emptying the powder out of the outlet conduit. The opposite ends of the metering chamber are movable toward and away from one another so as to vary the size of the metering chamber.

Grooves on the slide prevent shearing off of powder particles as the slide moves past the inlet opening. Emptying means on the powder reservoir permit the removal of unused powder without the necessity of inverting the metering device.

3,670,929

BEVERAGE DISPENSING KEG

Harry E. Berry, Hollywood, Fla., assignor to Richard Kerek; John Kerek, Cleveland, Ohio and R. E. De La Hunt, part interest to each

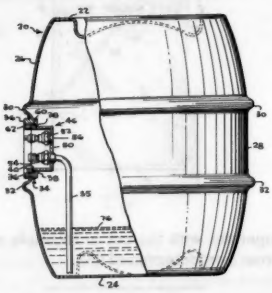
Filed Jan. 27, 1970, Ser. No. 6,150

Int. Cl. B65d 83/00

U.S. Cl. 222—400.7 **3 Claims**

A beer keg construction having only a single access aperture opening midway between the top and bottom of the side

wall of the keg with first and second male component quick-connect connectors being mounted inwardly of the aperture in the keg on an endwall of a cylindrical cup-like support member which can be removed from the aperture to enable



cleaning and filling of the interior of the keg and with two female component quick-connect connectors on a pressure hose and lager hose being connectable to the male component connector members to enable liquid dispensing and keg pressurization with a minimum of difficulty.

3,670,930
OVERHEAD TRAVELING TYPE FUEL SUPPLYING APPARATUS

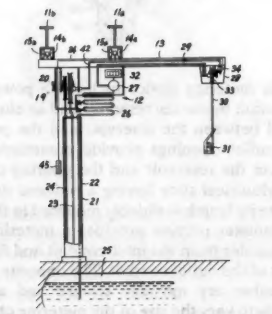
Yoshihiko Irie, Kawasaki, and Fumio Kimura, Tokyo, both of Japan, assignors to Tokyo Ltd., Kanagawa-ken, Japan

Filed March 22, 1971, Ser. No. 126,525

Claims priority, application Japan, March 23, 1970, 45/24262

Int. Cl. B67d *5/60*

U.S. Cl. 222—527 **6 Claims**



A fuel supplying apparatus consists of a traveling unit which moves in either of opposite directions, a delivery unit which communicates with the traveling unit and has a fuel hose carrying a fuel supplying nozzle at one end thereof and being lowered and raised, a fixed conduit which communicates with a reservoir and extends uprightly near to the traveling unit, and a folding tube which connects the fixed conduit with the traveling unit. The folding tube is composed of a plurality of non-flexible rigid tubes each of which is pivotally connected and internally communicates with its adjacent tubes at its ends. As the traveling unit moves, the folding tube stretches or contracts without deforming the component tubes.

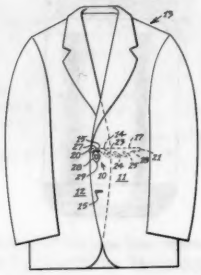
3,670,931
GARMENT FORM RETAINER

William F. Hosey, Hermitage, Tenn., assignor to Old Hickory Mfg. Co., Old Hickory, Tenn.

Filed April 28, 1971, Ser. No. 138,233

Int. Cl. A41b *5/00*; **A41f** *1/00*

U.S. Cl. 223—71 **7 Claims**



A garment form retainer for overlapping front panels of a coat comprising an elongated flat body of stiff but slightly flexible plastic material. Formed in the body are a plurality of longitudinally spaced button-receiving slots. Formed adjacent the end of the body is a tab fixed to, and offset from, the front surface of the body and converging down toward the plane of the body.

3,670,932
SOCK IRONING DEVICE

Luis Sentis Anfruns, Panama Street 2 and 4, Barcelona, Spain

Filed April 13, 1970, Ser. No. 27,821

Claims priority, application Spain, April 12, 1969, 147,380

Int. Cl. D06c *5/00*; **D06f** *59/00*

U.S. Cl. 223—75 **1 Claim**

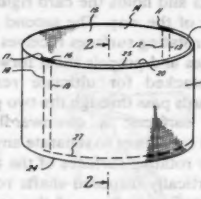
Disclosed herein is an iron for ironing socks or stockings so that the sole portions thereof are disposed in a plane which is perpendicular to the plane of a conventionally ironed sock. That is, the iron comprises an elongated flat member having a projecting portion fixed transversely thereto and defining a portion for extending into the heel section of a stocking which is to be ironed. Thus, the iron disclosed therein functions to iron stockings or socks into a form which more closely approximates the form of a human foot.

3,670,933

PERSONAL MONEY CONTAINER

Cherry E. Jones, 10213 Caxton, Houston, Tex.

Filed July 13, 1970, Ser. No. 54,108
Int. Cl. A44c 5/00
U.S. Cl. 224—28 B 1 Claim



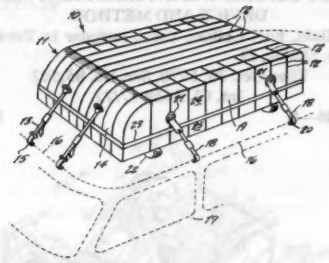
The specification discloses a personal money container which can be worn on or about the person such as on an arm or a leg for carrying money or other valuables in a concealed or inconspicuous manner. One embodiment discloses a container for money or other valuables which can be clipped or otherwise attached inside of an article of underclothing such as a brassier or, if desired may be attached to a swim suit or the like.

3,670,934

BUDGET CARRIER

Maurice A. Kraselsky, 7118 Jones Valley Drive, Huntsville, Ala.

Filed Aug. 25, 1970, Ser. No. 66,793
Int. Cl. B60r 9/04
U.S. Cl. 224—42.1 E 1 Claim



A carrier for placement upon the roof of an automobile, the carrier comprising an inexpensive telescopic two part construction made of non-cracking plastic material and comprising a case having molded ribs for providing rigidity thereto, the carrier being provided with adjustable straps each of which is provided with a hook for hooking to the automobile roof gutters.

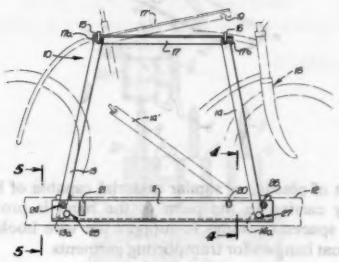
3,670,935

COLLAPSIBLE CYCLE CARRIER

Paul R. Hinkston, 10723 Cushdon Avenue, Los Angeles, Calif.

Filed Nov. 9, 1970, Ser. No. 87,952
Int. Cl. B62d 43/00
U.S. Cl. 224—42.03 B 13 Claims

A collapsible cycle carrier for an automobile or like vehicle. The carrier comprises a pair of support arms pivotally connected to opposite ends of a channel bar, and a crossbar which extends between the free ends of the support arms when the arms are set upright for cycle carriage. A bicycle may be supported on cycle hooks extending from the support arms. Vehicle bumper attachment members extend rearwardly from the channel bar. Stability of the carrier is insured by appropriate support arm rotation limiting means attached to the channel bar. To collapse the cycle carrier, the crossbar arm is detached from one support arm, swung into alignment with the other arm to which it is pivotally connected, and the support arms and crossbar folded into the channel bar.

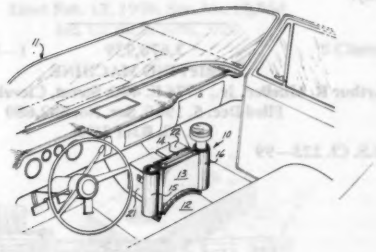


3,670,936

AUTOMOBILE ACCESSARY HOLDER

Charles F. Pronovost, 6429 195 Avenue, and Dale L. Prangley, 8407 184th Lane East, both of Sumner, Wash.

Filed Sept. 30, 1970, Ser. No. 80,514
Int. Cl. B60r 7/04
U.S. Cl. 224—42.42 3 Claims

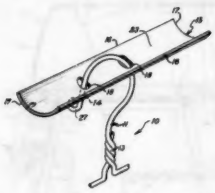


The disclosed automobile accessary holder comprises a flat map case, a padded flashlight holder on each side of the map case, means for mounting radio transmitters, or the like, on one surface of the map case, and arcuate ends formed on lower edges of the map case along with a padded map case bottom for fitting on the transmission shaft tunnel on most automobiles. A very efficient, compact, and sturdy automobile accessary holder is thus formed.

3,670,937
CARRIER FOR HOOK TYPE COAT HANGER

Michael S. Bradshaw, 1546 West Mulberry, Kokomo, Ind.

Filed March 4, 1970, Ser. No. 16,412
Int. Cl. A47g 25/06
U.S. Cl. 224—45 T 4 Claims

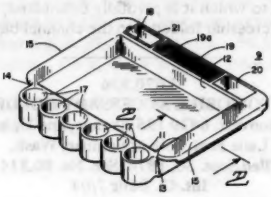


Sheet of plastic, or similar material capable of being comfortably carried in the palm of the hand is provided with slotted spaced openings to support the wire hook of one or more coat hangers for transporting garments.

3,670,938
DISH TRAY

Samuel C. Brocato, 501 South Apacheway, Scottsdale, Ariz.

Filed Oct. 19, 1970, Ser. No. 82,008
Int. Cl. A47g 23/06
U.S. Cl. 224—48 R 3 Claims

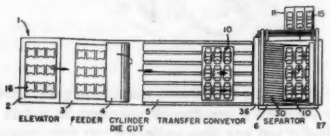


An improved flat bottom compartmentalized tray for holding and carrying dishes, food products, and eating accessories wherein the compartments are arranged along the sides of the tray.

3,670,939
STRIPPING MACHINE

Arthur R. Mueller, Jr., 1776 E. 40th Street, Cleveland, Ohio

Filed Dec. 5, 1969, Ser. No. 882,680
Int. Cl. B26f 3/02
U.S. Cl. 225—99 12 Claims



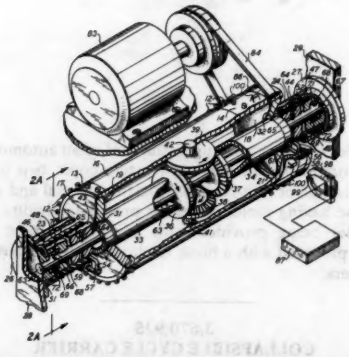
Disclosed is a machine for separating cards from the scrap of paperboard sheets from which they have been die cut except for small integral connecting tangs. The cards may include one or more interior cutouts for hanging the merchandise holding cards on display racks.

The machine of the invention includes a base having one side higher than its opposite side and spaced chain driven parallel transverse feed shafts journalled in bearings mounted on the opposite sides. The feed shafts rotate in a single direction toward two pairs of shafts mounted on the end of the frame. The first pair of shafts has vertically disposed opposing rotating surfaces which engage the scrap areas of the sheets to drive the sheets forward against a card and scrap separating tool which supports and holds the card rigid in the region of separation the rest of the way. The second pair of vertically disposed opposing rotating surfaces receives the card only on one of the tool sides and propels them forward to a bin into which they are stacked for ultimate removal from the machine. As the cards pass through the two pairs of vertically disposed rotating surfaces, a downwardly biased sprigg member is dragged over them to separate any internal cutouts from the card. The rotating surfaces of the first, or scrap engaging, pair of vertically disposed shafts rotates at a speed slower than the rotating surfaces of the card engaging pair such that the integral tangs connecting the two are severed near their region of support by the tools by a twisting transverse force, and the scrap from the sheet falls down to a collection area below the separating knife. To avoid bending of the cards, the cards travel in a substantially straight line from the time they leave the feed rolls. The feed rolls have floating spheres which act as hold-down means to provide more positive forward drive to the cut sheets as they enter the first pair of vertically disposed rotating surfaces. The apparatus is designed to be automatically fed by means of a belt-type transfer conveyor which receives the die cut paperboard sheets from the die cutting machine. The entire system may be automated by conventional elevator and feeder means for providing printed paperboard to the cutter die. In the alternative, the separator machine may be hand fed. The tools, rotating surfaces and spring members may be adjusted for different shapes, numbers and dimensions of card, scrap and interior cutouts.

3,670,940
ENERGY CONSERVING INTERMITTENT MOTION DEVICE AND METHOD

David A. Dahl, Fort Collins, Colo., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 30, 1970, Ser. No. 85,502
Int. Cl. B65h 17/22
U.S. Cl. 226—8 14 Claims



In an energy conserving intermittent motion device, energy is alternately stored and released by twisting and untwisting a torsion rod to intermittently rotate a driven member, e.g., a feed platen. The torsion rod is twisted and untwisted by selectively restraining and releasing opposite ends thereof through pairs of clutch devices. Frictional losses in the system are compensated for by a servo-controlled variable torque motor which is controlled so as to supply just enough torque to compensate for the frictional losses.

3,670,941
RETRACTABLE GUARD AND GUIDE FOR NAILER

Fred I. Grinnell, 2122 63rd, Seattle, Wash., and Clark J. Hall, 8509-17th Place, N.E., Seattle, Wash.

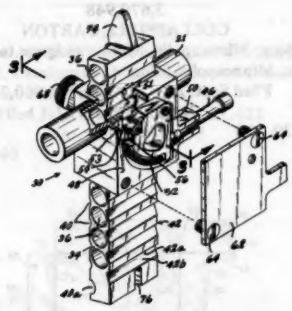
Filed March 2, 1970, Ser. No. 15,479
Int. Cl. B25c 7/00
U.S. Cl. 227—8 5 Claims

A guide and guard plate pivoted on the head of a driver for nails or staples projects beyond the head for engagement with an edge of a crate, for example, to guide the driver head for inserting fasteners along the margin of the work. In such projected position the plate shields the safety prongs from being depressed inadvertently to condition the driver for operation. The plate can be swung into retracted position for face nailing spaced farther from the work edge by grasping a handle on it, and a spring-tensioned strip attached to the plate will return it to projected position when the handle is released.

3,670,942
AUTOMATIC FEEDING OF FASTENERS

Raymond Visher Pomeroy, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Oct. 15, 1970, Ser. No. 80,915
Int. Cl. B25c 1/14
U.S. Cl. 227—10 3 Claims

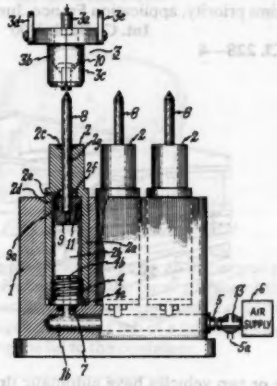


A feeding clip having relief portions enabling the clip to be gripped and moved forward in response to an actuating device of the fastening tool, and further including indexing means for registering a fastener held in the clip with the driving ram of the fastening tool. The indexing means operates as the tool is cocked in readiness for firing. The clip is advanced forward to move a fastener into position. Upon firing, a driving ram in the tool drives the fastener through the clip and into the work surface. Release of the tool followed by further cocking in readiness for a second firing advances the clip through the tool to align the next successive fastener with the driving ram.

3,670,943
RIVETING DEVICE

John G. Berger, Flat Rock, N.C., assignor to General Electric Company

Filed Jan. 6, 1971, Ser. No. 104,270
Int. Cl. B21j 15/34
U.S. Cl. 227—60 9 Claims

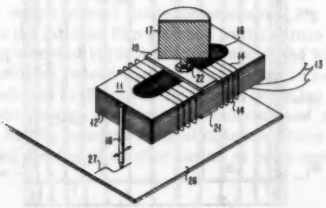


Riveting device includes an anvil structure having a movable piston and attached pin for guiding a rivet to riveting position. The piston is movable by air under pressure and has an O-ring gasket which frictionally engages the walls of a bore in the base member below the anvil in which the piston moves. The O-ring enables the guide pin to retain the rivet in position prior to reaching the anvil, and holds the pin in retracted position to enable the riveted parts to be readily removed.

3,670,944
MINIATURE ULTRASONIC BONDING DEVICE

Sherman Z. Dushkes, and Rohinton J. Surty, both of Redwood City, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 12, 1970, Ser. No. 10,964
Int. Cl. B23k 1/06, 5/20
U.S. Cl. 228—1 5 Claims



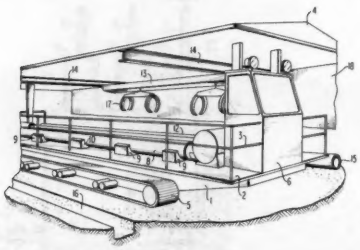
An ultrasonic bonding system is arranged so that the magneto-strictive transducer is situated above and at right angles to a bonding tip. The transducer is held by a mounting means and lateral straps which are affixed at the node on the body of the transducer. The mounting means is above the transducer. The bonding tip is fastened directly to the transducer without intervening driver or horn.

3,670,945

MOBILE ASSEMBLY FOR THE INSTALLATION OF CONDUITS BY WELDING SUCCESSIVE TUBULAR ELEMENTS

Jean Furstenberger, Bois D'Arcy; Guy Lebrun, Vignieres-Annecy Le Vieux, and Denis Girault, Annecy, all of France, assignors to Societe Alsacienne de Constructions Atomiques de Telecommunications et d'Electronique (Alcatel), Paris, France

Filed June 3, 1970, Ser. No. 43,152
Claims priority, application France, June 6, 1969, 6918854
Int. Cl. B23k *1/00*
U.S. Cl. 228—4 **7 Claims**



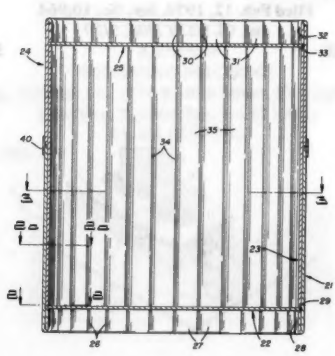
One or two vehicles have automatic driving units for lining up the spindles of the operating units joined to hollow shafts inserted in the units which are to be welded. Each shaft bears, at its free end, a mandrel to be friction fitted simultaneously in the unit to be welded and in the previously welded unit to ensure that the ends of the two tubes coincide precisely while they are being welded.

3,670,946

DRUM-LIKE CONTAINER OF TELESCOPING TYPE SET-UP FROM FOLDED FLATS OF SHEET MATERIAL

Thomas E. Croley, Worthington, Ohio, assignor to Corco, Inc., Columbus, Ohio

Filed Feb. 16, 1971, Ser. No. 115,312
Int. Cl. B65d *3/00*
U.S. Cl. 229—4.5 **10 Claims**



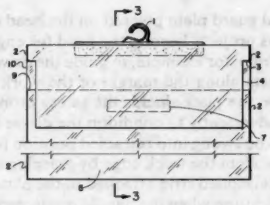
A drum-like container comprising upper and lower bodies of substantially drum-like form telescopically interfitting. Each of the bodies is set up from one or more flat blanks of sheet material which is scored to provide a plurality of panels connected together at scored vertical fold lines. One horizontal edge of a blank for the upper or lower body is turned inwardly to provide an axially inwardly flange providing a shoulder at its inner extremity. The respective ends of the blank are laterally overlapped and secured together at a vertical seam. The blank is folded flat about two of the vertical fold lines to provide superimposed sections, each section consisting of a plurality of connected vertical panels. This folded and collapsed flat can be expanded into polygonal tubular form with upper and lower open ends and with the inwardly disposed shoulder at one end. To maintain the tubular form, a rigid disc of proper diameter is moved axially into and tightly fitted therein in contact with the shoulder.

3,670,947

HANGER BAG WITH FLAP CLOSURE

Albert Joseph Tangredi, and Marc Robert Zuckerman, both of Bayside, N.Y., assignors to W. R. Grace & Co, Duncan, S.C.

Filed Aug. 10, 1970, Ser. No. 62,322
Int. Cl. B65d *31/00, 33/06*
U.S. Cl. 229—54 R **5 Claims**



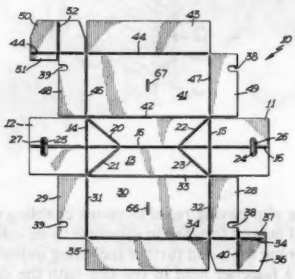
A hanger bag is formed from a single, elongated, sheet of flexible thermoplastic film by cutting a series of spaced apart notches in one of the longitudinal edges of said film, the distance between said notches being the desired width of the finished bag; doubling back the opposite longitudinal edge of the sheet to the desired height of the finished bag; folding the notched edge over the opposite edge; heat-sealing a hanger or handle member to the upper folded over edge between the spaced apart notches; and, heat-sealing and severing the folded film transversely, said heat seal passing through said notch, whereby a finished bag is formed.

3,670,948

COLLAPSIBLE CARTON

Max H. Berg, Minneapolis, Minn., assignor to Peter Berg & Co., Inc., Minneapolis, Minn.

Filed Sept. 24, 1969, Ser. No. 860,711
Int. Cl. B65d *5/22*
U.S. Cl. 229—33 **1 Claim**



A collapsible unitary carton is formed of corrugated cardboard or paper board from a single blank and is folded and scored to provide seamless load-bearing members at the areas requiring the greatest strength. The ends and side members are joined so that a seamless bottom is provided and all the

seams are removed from the corners or edges of the carton and only a single thickness of the material is used where the members must be folded to provide as flat a carton as possible when collapsed.

3,670,949

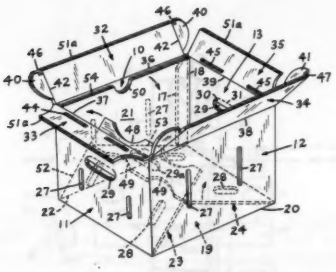
COLLAPSIBLE CARTON

Hector J. Galanes, Rio Piedras, P.R., assignor to International Paper Company, New York, N.Y.

Filed June 3, 1970, Ser. No. 42,990

Int. Cl. B65d *5/02*

U.S. Cl. 229—39 R **9 Claims**



A collapsible carton and the single blank from which same is prepared are provided, said carton and blank comprising foldably connected outer wall panels and further characterized by an inner and outer bottom panel, each of which is foldably connected to an opposed outer wall panel, and a pair of opposed inner wall panels which are foldably connected to said outer bottom panel. The outer bottom panel, to which the internal side panels are attached, is maintained in a supportive position by the restraining force exerted against the vertical edges of the inner wall panels by the outer side wall panels in the assembled position. The inner bottom panel rests atop the first bottom panel and is supported thereby. The carton may be further provided with ventilation and handle apertures, cover panels, and a variety of other modifications.

3,670,950

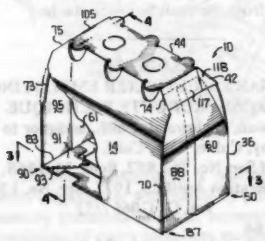
TUBULAR CARTON WITH AXIALLY CLOSED ENDS

Harry J. Rossi, Parsippany, N.J., assignor to Continental Can Company, Inc., New York, N.Y.

Filed July 1, 1970, Ser. No. 51,422

Int. Cl. B65d *75/08*

U.S. Cl. 229—40 **4 Claims**



This disclosure relates to a carton blank and a carton formed therefrom which includes top, side and bottom panels with the side panels each including an end panel joined thereto along a fold line whereupon being set up into a generally tubular configuration the end panels close axially opposite ends of the carton. Novel locking panels are also associated with the top and side panels to maintain the upper end portions of the end panels generally normal to both the top and side panels.

3,670,951

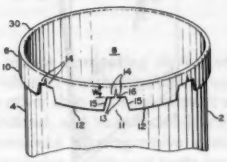
CONTAINER AND LID

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company

Filed June 11, 1970, Ser. No. 45,387

Int. Cl. B65d *43/10*

U.S. Cl. 229—43 **7 Claims**



A container has a container flange on an upper end portion of the container extending about the outer surface of the container. The container flange has at least one first portion for contacting and engagement with a tab of a lid of the container for releasably locking the lid to the container.

3,670,952

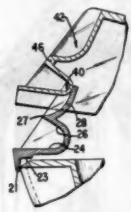
EGG CARTON

Richard Joseph Venuti, 56 Laurel Road, Wilbraham, Mass.; Jerold Julius Golner, 32 Hanson Terrace, Lowell, Mass., and Anthony Salvatore Amato, 34 Berkeley Drive, Chelmsford, Mass.

Filed Feb. 3, 1971, Ser. No. 112,278

Int. Cl. B65d *85/32*

U.S. Cl. 229—44 R **5 Claims**



An egg carton having a latching arrangement which includes inwardly projecting lugs on the front panel of the carton cover which extend into corresponding lug receiving recesses on the latching flap attached to the carton tray, said flap having indented vertical channels above the top wall of said lug receiving recesses permitting the lugs to pass within said channels and to slide over the top rim of the lug receiving recesses into locking position with said recesses, said front panel also having indented vertical channels above each lug for receiving the lug of another carton in open nesting relationship.

3,670,953

BAG

Howard L. Leventhal, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

Filed Dec. 10, 1970, Ser. No. 96,854

Int. Cl. B65d *33/00*

U.S. Cl. 229—57 **4 Claims**

A container made from thin-wall, flexible, gusseted, tubing material that opens into a bag having a rounded, generally flat,

high-strength bottom. The bag, when folded flat for packaging, has three superimposed panels provided by longitudinal

fold lines. The panels include a pair of outer plies and a pair of inner plies. One end of the bag is heat sealed to provide a bottom closure for the bag.

3,670,954

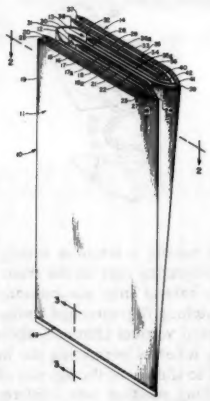
BAG

Howard L. Leventhal, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

Filed Dec. 10, 1970, Ser. No. 96,855

Int. Cl. B65d *33/00*

U.S. Cl. 229—57 **3 Claims**



A container made from thin-wall, flexible, gusseted, tubing material that opens into a bag having a rounded, generally flat, high-strength bottom. The bag, when folded flat for packaging, has four superimposed panels connected by alternating longitudinal fold lines to provide a bag with Z or accordion folds. The panels include a pair of outer plies and a pair of inner plies. One end of the bag is heat sealed to provide a bottom closure for the bag.

3,670,955

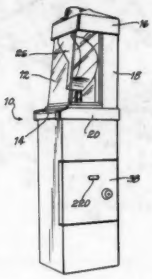
EXACT FARE SYSTEM

George G. Dominick, 198 Payson Street, Hoffman Estates, Ill.; Rinaldo Sciacero, 1115 East Rockwell, Arlington Heights, Ill.; George I. Wimpffen, 23W602 Saint Charles Road, Wheaton, Ill., and Theodore L. Kardos, 4656 North Central Park Road, Chicago, Ill.

Filed March 19, 1970, Ser. No. 20,884

Int. Cl. G07b *15/00*

U.S. Cl. 232—7 **28 Claims**



A construction for collecting exact fares comprising a housing having an inspection surface for temporarily holding fares deposited and manually operable means for dumping fares from said inspection surface into a cash box area. A removable cash box is received in a cash box receptacle, and closure means are provided in the cash box for blocking an access opening to normally prevent access to the interior of the cash box. Means are located in the receptacle to normally lock the closure means against movement relative to said access opening, and key means operate to unlock the closure means upon insertion of the cash box into the receptacle to thereby permit rotation of the cash box to locate the cash box in a position such that the access opening will receive fares dumped from the inspection surface. An interlock arrangement is included in the receptacle door to prevent tampering and pilfering. The total exact fare system includes a vault associated collecting means with security features to prevent pilfering after removal of the cash box from the cash box receptacle.

3,670,956

DIGITAL BINARY MULTIPLIER EMPLOYING SUM OF CROSS PRODUCTS TECHNIQUE

Donald F. Calhoun, Inglewood, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

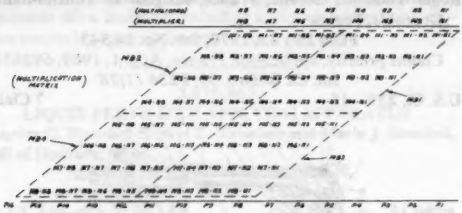
Continuation of Ser. No. 762,852, Sept. 26, 1968, abandoned. This application April 23, 1971, Ser. No. 136,808

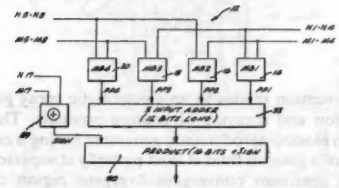
Int. Cl. G06f *7/52*

U.S. Cl. 235—164 **6 Claims**

A high-speed digital multiplier which includes a plurality of functionally and structurally similar multiplier modules which are independent and operate in parallel. The multiplicand and multiplier bits are ANDed and selectively applied to the multiplier modules in accordance with a geometrically similar partitioning of the multiplication matrix. The multiplier modules provide partial products which are then added together to form the final product. The disclosed multiplier may be ex-

panded for longer word lengths by using additional multiplier modules. The multiplier may be fabricated from a plurality of





single type gated full adder circuits which is advantageous for large scale integration techniques.

3,670,957

ADDING, SUBTRACTING AND TOTALING CALCULATOR

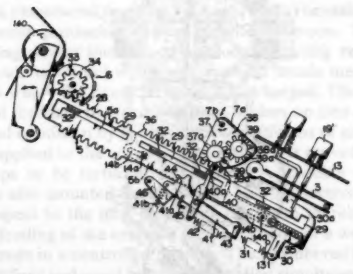
Harutaro Oba; Toshihiko Sawazu; Sugio Takeuchi, and Masaru Chikata, all of Shizuoka-ken, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1970, Ser. No. 8,675

Claims priority, application Japan, Feb. 6, 1969, 44/8407; Feb. 6, 1969, 44/8408; Feb. 10, 1969, 44/9929; Sept. 4, 1969, 44/69876; Feb. 6, 1969, 44/10340; Feb. 10, 1969, 44/11497

Int. Cl. G06c *29/00*

U.S. Cl. 235—60 TN **4 Claims**



A portable calculator comprising a plurality of memory transmitting units engageable with memory pins, guide plates for guiding memory transmitting units, accumulators, a carry mechanism consisting of carry members mounted on respective counter wheels, transfer members engageable with the corresponding carry members, levers pivotally supporting the transfer members and operating members for raising the rear end of the supporting members, and a credit balancing mechanism, the calculator simultaneously making different sets of calculations including addition, subtraction, subtotaling and totaling and locking the credit balancing mechanism when the balancing operation is not conducted.

3,670,958

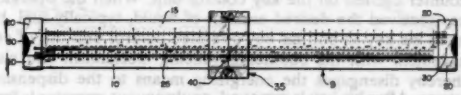
SLIDE RULE

Svetislav M. Radosavljevic, 9807 South Seely Avenue, Chicago, Ill., and John Maniotes, 1637 Holly Lane, Munster, Ind.

Filed June 17, 1970, Ser. No. 47,006

Int. Cl. G06g *1/02*; **G09b** *19/02*

U.S. Cl. 235—70 A **8 Claims**



A mechanical analog computing device of the slide rule type is disclosed wherein the multiplication and/or division of numbers from an other than decimal number system (e.g., binary, octal, duodecimal, and hexadecimal) may be performed by combined operations in progressive manipulations. The disclosed device includes a slide and body upon which scales are graduated in accordance with the logarithm to the other than decimal base concerned. This device can be also used for finding the reciprocal or inverse of numbers from the other than decimal numeral system.

3,670,959

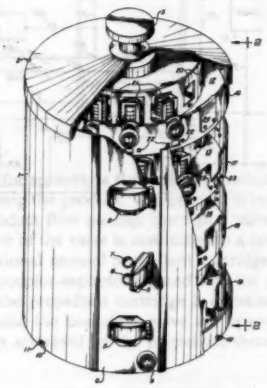
KEY OPERATED METER MONITOR

Leland B. Larson, and Clyde H. Clement, both of Phoenix, Ariz., assignors to Eugene G. Shaheen, Scottsdale, Ariz., a part interest

Filed July 21, 1971, Ser. No. 164,501

Int. Cl. G06m *1/00*

U.S. Cl. 235—94 R **5 Claims**



Apparatus is provided for accurately accounting for the amount of gasoline, diesel fuel, or the like, withdrawn from a single source by each of a plurality of users. A drumlike outer cover is provided with a plurality of vertically aligned access ports for receiving a key unique to the individual user. A secondary port provides identification of the key unit aligned with the port. Rotatable, multi-tiered structure within the cover includes a plurality of circumferentially distributed key control units on a plurality of vertically spaced tiers. The key control units are slightly offset from one another from tier to tier such that only a single key control unit may be aligned in the key receiving position at one time. Means are provided for manually rotating the multitiered structure in order that a user may bring his individual key operated control unit into the key receiving position. When the operator inserts and rotates his

key, his individual controlled key operated unit is moved radially inwardly by cam structure turned by the key. In the fully inward position, a counter gear on the key operated control unit meshes with a gear driven from the dispensing source. Additionally, a projection from the key operated control unit actuates switch means for energizing the dispensing source which may then be utilized in the usual manner with the amount of dispensed liquid being recorded on the individual counter carried on the key control unit. When the operator has received the desired amount of liquid, typically fuel, he turns his key to pull his key operated control unit out of engagement with the counter advancing mechanism and also thereby disengages the energizing means to the dispensing source. After his key is removed, a subsequent operator is free to bring his individual key operated control unit into alignment with the appropriate one of the ports at which time the procedure may be repeated and the amount of liquid dispensed recorded on his key operated control unit. The counters may therefore be read periodically to bill or otherwise require accounting from each individual user.

3,670,960

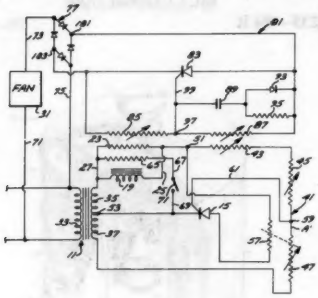
CONTROL APPARATUS

William W. Chambers, Anaheim, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 814,939, April 10, 1969, abandoned. This application Sept. 14, 1970, Ser. No. 72,215

Int. Cl. G05d *23/24*

U.S. Cl. 236—11 **8 Claims**



A control apparatus comprising a switch controlling current flow to an inductance means which is coupled with a controlled element. A free wheeling resistor is connected in parallel with the inductance means and defines a path for reverse flow of induced current therethrough during collapse of the magnetic field in the inductance means. A heat responsive control circuit is provided for controlling a controlled device and includes a heat responsive element disposed in heat exchange relationship with the resistor whereby when the switch is turned on current during positive going half cycles will be directed through both the resistor and inductance means, and the current induced by collapse of the magnetic field in the inductance means will flow in the reverse direction through the resistor thereby permitting continued flow in the forward direction through the inductance means and after a selected time the self-heating of the resistor will heat the temperature responsive element to actuate the control circuit and, consequently, the controlled device.

3,670,961

ELECTROSTATIC SPRAY GUN

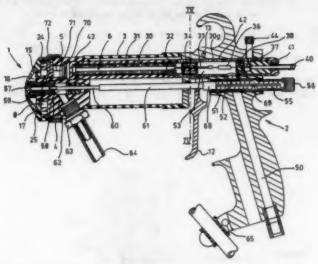
Roger Tholome, Corenc, France, assignor to Tunzini-Sames, Grenoble, France

Filed July 13, 1970, Ser. No. 54,543

Claims priority, application France, Aug. 1, 1969, 6926387

Int. Cl. B05b *5/00*; F23d *11/28*

U.S. Cl. 239—15 **7 Claims**



This invention relates to an electrostatic spray gun for the atomization and spraying of coating products. The gun includes an electro-aerodynamic generator having a conduit for the flow of a gaseous fluid at least partially at supersonic speed from an upstream convergent-divergent region containing ionization means to a downstream zone at high potential adjacent the atomization nozzle. According to the invention, means for shutting of the flow of gaseous fluid are arranged downstream of the electro-aerodynamic generator, for example on the nozzle body. The electro-aerodynamic generator is preferably constructed as a removable cartridge, and means are also provided for adjusting the angle and velocity of the output spray from the gun.

3,670,962

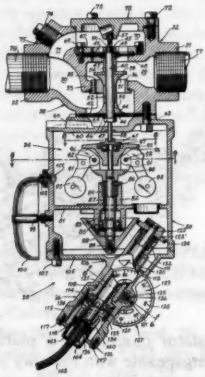
FLOW CONTROL ASSEMBLY AND METHOD

Douglas Johnston, Decatur, Ala., assignor to Decatur Foundry & Machine Co. Inc., Decatur, Ala.

Filed Nov. 19, 1969, Ser. No. 877,977

Int. Cl. B05b *3/16*

U.S. Cl. 239—62 **8 Claims**



The present control structure is a centrifugal governor operated relatively low pressure diaphragm valve for a wheeled liquid applicator including a tank for liquid under applied air pressure, the governor being driven from a ground wheel of the applicator by a friction wheel-flexible cable drive, or a belt and pulley drive, or the like. This structure controls

the applicator nozzle pressure so that the output, in gallons per minute, is proportioned to the speed, thereby providing a constant gallons per acre output, regardless of the speed. An adjustable drive assembly including a friction wheel-cone provides means for varying the rate of fluid output.

3,670,963

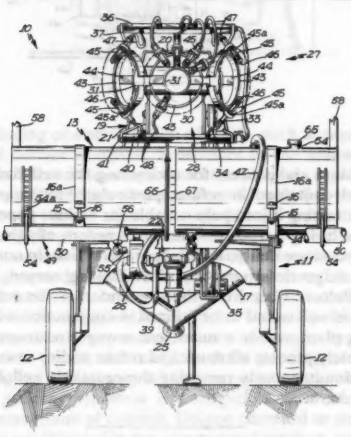
LIQUID FERTILIZER APPLYING APPARATUS

Maurice G. Stroebel; Terryl T. Stroebel, and Merle J. Stroebel, all of Danvers, Minn.

Filed Sept. 4, 1970, Ser. No. 69,576

Int. Cl. A01n *17/08*

U.S. Cl. 239—77 **3 Claims**



A mobile apparatus for applying liquid fertilizer, herbicide, pesticides and the like to crops comprises a mobile chassis having a chambered fertilizer (or weed killer) containing tank and a mist producing device mounted thereon. The mist producing device includes a fan housing having rearwardly facing outlets around which are arranged nozzle mechanisms through which the liquid fertilizer is discharged. The fine jets of liquid fertilizer or weed killer are broken up into a mist or atomized condition by the high velocity streams of air and the mist is applied to the crops as the apparatus is moved through the crops to be fertilized or treaded. A foldable sectional boom is also mounted on the chassis and is selectively usable with respect to the mist producing device to thereby permit foliage feeding of the crops or the application of a weed killer to the crops in a controlled manner. The chambered tank permits fertilizer and weed killer to be applied simultaneously but obviates the need for mixing.

3,670,964

JET NOZZLE

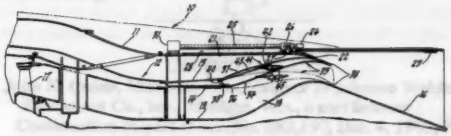
George H. Pedersen, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 18, 1971, Ser. No. 107,081

Int. Cl. B63h *11/10*

U.S. Cl. 239—265.19 **4 Claims**

A jet nozzle for a turbofan-ramjet type engine in which leaves in the termination of the boundary between a fan duct and a turbine outlet duct are movable between an outer wall and a tailcone to throttle or close either duct, the outer wall



further including an axially shiftable shroud to vary the discharge outlet area between it and the tailcone.

3,670,965

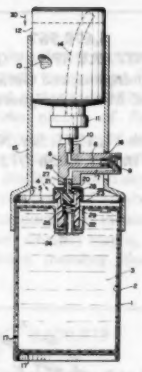
NON PRESSURIZED PRODUCT DISPENSING SYSTEM

Jean Marand, Norwalk, Conn., assignor to Ciba-Geigy Corporation

Filed June 4, 1970, Ser. No. 43,417

Int. Cl. B05b *7/30*

U.S. Cl. 239—308 **8 Claims**



A dispenser for spraying a fluid product includes a product container housing the product. The product is in communication with a product flow passage through a valve of the container. The stem of the valve is connected to a coupler-aspirator. A conventional aerosol propellant cartridge is also connected to the coupler-aspirator aligned with the product container. When the propellant cartridge is depressed, both the valve thereof and the container valve are opened. Thus the product is then aspirated by the propellant through the coupler-aspirator.

3,670,966

SPRAY CONTROL VALVE

Gerhard F. Korda, Franklin Park, Ill., assignor to H. D. Hudson Manufacturing Company, Chicago, Ill.

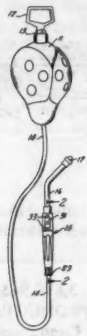
Filed Feb. 1, 1971, Ser. No. 111,412

Int. Cl. B05b *7/32*; F23d *13/04*

U.S. Cl. 239—337 **8 Claims**

A hand operated sprayer includes a tank containing liquid to be sprayed under pressure connected to a flexible hose with an extension tube having a nozzle at its discharge end for controlling the spray pattern. A leakproof control valve is interposed between the hose and extension tube to turn on and shut off the flow of liquid to the extension tube. Such valve embodies a valve body with the liquid flowing in at one end and out at the other end. A plunger slidable within the body can be moved either to seal off the outlet opening or to unseal such opening and permit liquid to flow through by-pass chan-

nels in the plunger. A thumb knob passes through a slot in the valve body and is affixed to the plunger for easy movement.



The plunger is provided with an elliptical or rectangular channel holding an O-ring to prevent leakage around the slot and thumb knob.

3,670,967

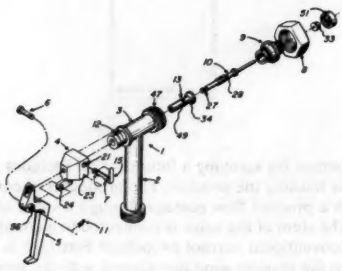
SANITARY SPRAY GUN

James R. Fahlin, Bloomington, and Gerald D. Hagfors, Columbia Heights, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed March 11, 1971, Ser. No. 123,134

Int. Cl. B05b 7/12

U.S. Cl. 239—412 **10 Claims**



An airless sanitary spray gun which can be easily disassembled by hand. The fluid outlet housing of the gun has a valve to normally block the flow of fluid. Mounted on this housing is another housing designating the valve actuating housing. The device to join these two housings may consist of two locking members. One is a rotatable rod and groove combination wherein the rod extends through an opening in the valve actuating housing and is rotated to a locking position by engaging a groove in the top of the outlet housing. The other device, used to prevent rotation of the two housings relative to each other, may be one or more pins in the lower portion of the valve actuating housing with each pin engaging a notch in the upper portion of the outlet housing. Two types of valves are also disclosed. One embodiment is a small apertured spring biased needle type used for fine spraying operations. The other valve is a larger apertured dispensing type biased by a remote spring that utilizes a forced differential pressure principle to aid in keeping the valve seat seated. The gun may have its valve actuated either manually or automatically.

3,670,968

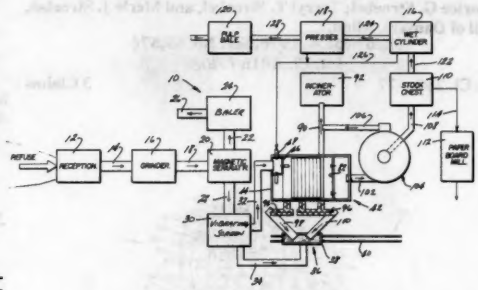
SYSTEM AND PROCESS FOR RECOVERY OF CELLULOSIC FIBROUS MATERIAL FROM REFUSE

Sergio F. Galeano, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed June 2, 1970, Ser. No. 42,686

Int. Cl. B02c 21/00

U.S. Cl. 241—21 **9 Claims**



A system and process for recovering the cellulosic fibrous material contained in refuse, particularly municipal refuse, and converting it into pulp suitable for various paper product manufacturing purposes. The novel system of this invention features unique defiberation apparatus which, in combination with a magnetic separator and a vibrating screen, separates the cellulosic fiber from the remainder of the refuse. This system is well suited to be utilized in conjunction with a composting plant and/or a municipal sewage treatment plant to completely process all municipal refuse and/or sewage sludge while simultaneously removing the reuseable cellulosic fiber therefrom.

3,670,969

METHOD OF SEPARATING INSULATION FROM INSULATED WIRES AND CABLES

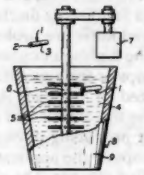
Manzo Terada, Kitakatsuragi-gun, Japan, assignor to Nissho-Iwai Company Limited, Osaka, Japan

Filed Dec. 2, 1969, Ser. No. 881,484

Claims priority, application Japan, Dec. 20, 1968, 43/93939; Dec. 23, 1968, 43/94369

Int. Cl. B02c 13/18

U.S. Cl. 241—27 **1 Claim**



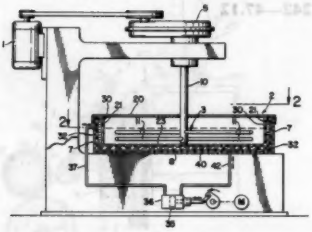
A method of separation and sorting of the insulation-cover from the metal core of various electric wires and cables, comprising an agitation-tank providing an impact agitating force to small cut pieces of various insulated electric wires and/or cables in the middle of the tank which is filled with a liquid, at room temperature or properly heated, and a bath filled with a particular liquid which is lighter in its specific gravity than the metal core, but heavier than the insulation-cover, enabling perfect sorting of the insulation-cover from the metal core in the middle of the bath.

3,670,970

METHOD AND APPARATUS FOR COMMINUTING AND REACTING SOLIDS

Andrew Szegvari, c/o Union Process Inc., 1925 Akron-Peninsula Road, Akron, Ohio

Filed Oct. 19, 1970, Ser. No. 81,811
Int. Cl. B02c 17/16
U.S. Cl. 241—27 21 Claims



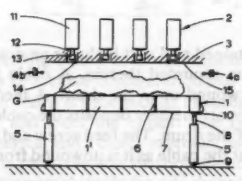
The grinding or comminution of solids, such as metal powders, and certain inorganic substances in the absence of a liquid continuum is accomplished at a relatively rapid rate in activated media of high momentum and low ball pressure, by rotating one or more rigid agitators through a relatively flat but properly proportioned (depth to diameter), bed of grinding media, such as relatively small balls, pebbles, etc. at a sufficiently high speed to cause the apparent volume of the grinding media to increase substantially in the agitated condition over that in the unagitated condition. The mean free paths between contacts of separate elements of the grinding media are therefore greatly increased, and the peening or burring energy applied to the material in process by contact between separate grinding elements is enlarged because of the increased momentum of contact. Unique chemical or structural properties are obtained in the comminuted product, especially when the dry grinding is continued beyond the point where appreciable decrease in average particle size occurs. Means is also provided in the apparatus to decrease or prevent caking of the partially ground material in portions of the apparatus.

3,670,971

CRUSHING MACHINE FOR COARSE CRUSHING OF BRITTLE MATERIALS

Paul Adrian Schneider, Oslo, Norway, assignor to A/S Ardal og Sunndal Verk, Oslo, Norway

Filed Dec. 17, 1970, Ser. No. 99,019
Int. Cl. B02c 1/14
U.S. Cl. 241—69 20 Claims



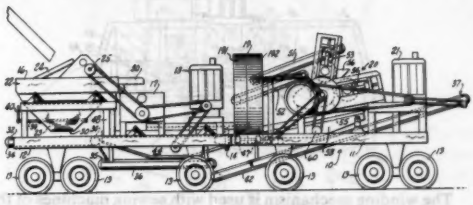
A crushing machine for the coarse crushing of brittle materials, such as anode butts in the aluminum electrolysis industry, by utilizing impact energy. The combination of a table or a grate with openings the size of which is dimensioned in accordance with the desired degree of crushing is used. Holding means cooperate with the grate and by relative movement of the holding means and the grate hold the goods to be crushed. One or more striking tools when the goods are held fast, preferably in an intermittent way, exert an impact effect on the goods. The grate and the holding means are pressed together continuously against the goods during the operation of the striking tool.

3,670,972

CRUSHING PLANT

John N. Quinn, Madison, Wis., assignor to Johnson Welding & Equipment Co., Inc., Madison, Wis., a part interest

Continuation-in-part of Ser. No. 882,197, Dec. 4, 1969, Pat. No. 3,622,089. This application June 1, 1971, Ser. No. 148,722
Int. Cl. B07b 1/28; B02c 21/02
U.S. Cl. 241—76 18 Claims



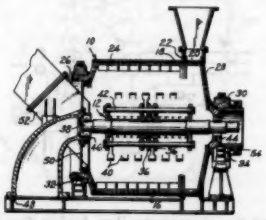
A crushing plant having elevator means located primary and secondary crushers, each comprising first and second stage crushing devices. Input material is fed into a receiving unit is separated thereby into pieces of finish size which are discharged onto a delivery conveyor, and pieces of two different larger sizes. The latter are separately fed to the primary crusher stages, which discharge onto separate screens located above the delivery conveyor. Carryover material on the screens is separately conducted by means including said elevator to the two secondary crusher stages, which discharge onto a common finish screen member also located above the delivery conveyor.

3,670,973

CRUSHER

Robert Lucas, Paris, France, assignor to Fives Lille-Cail, Paris, France

Filed July 20, 1970, Ser. No. 56,279
Claims priority, application France, July 23, 1969, 6925038
Int. Cl. B02c 17/00
U.S. Cl. 241—188 R 7 Claims

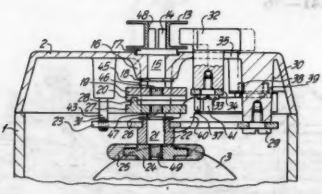


The bearings for the rotor of a crusher are positioned substantially in the end walls of a rotary drum concentrically surrounding the rotor, one of the bearings being mounted on a fixed support extending to an opening in one end wall, and the other bearing being mounted in the other end wall.

3,670,974
RELEASABLE WINDING MECHANISM FOR SEWING MACHINES

Odette Ueltschi, Steckborn, Switzerland, assignor to Fritz Gegauf AG Bernina-Nahmaschinenfabrik, Steckborn, Switzerland

Filed Jan. 21, 1971, Ser. No. 108,517
Claims priority, application Switzerland, Feb. 6, 1970, 1780/70
Int. Cl. B65h 54/18; D05b 59/00
U.S. Cl. 242—22 10 Claims

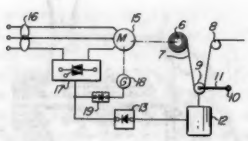


The winding mechanism is used with sewing machines of the type having a fixedly positioned winder shaft with a bobbin-receiving pin protruding from the machine casing, and a friction wheel for driving the winder shaft and having a friction wheel shaft separated from the winder shaft but operatively connected with the winder shaft and engageable with the driving wheel of the machine to selectively operate the winding mechanism. The inner end of the winder shaft has fixed thereto a disk with a slot extending diametrically thereof, and an end of the friction wheel shaft carries a cooperating disk having a pin or lug engageable in the slot. The friction wheel is mounted on a carrier which is spring biased to an operating position and a rest position. The driving connection between the two shafts is maintained at all times within the range of displacement of the friction wheel shaft between the operating and rest positions.

3,670,975
CONSTANT TENSION CONTROLLER DEVICE FOR WINDER

Yoshio Tomimatsu, Neyagawa-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 13, 1969, Ser. No. 876,284
Claims priority, application Japan, Nov. 20, 1968, 43/102210; Nov. 20, 1968, 43/102211
Int. Cl. B65h 59/38
U.S. Cl. 242—45 4 Claims

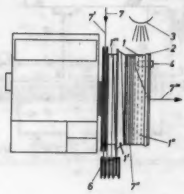


A constant tension controller device for a winder which comprises a differential transformer for generating an output voltage in response to a vertically movable roller moved up and down according to the tension of a yarn, and a tacho-generator connected with a three-phase induction motor for driving a spool for rotation, whereby electric current in one of three power lines of the three-phase induction motor is controlled by a thyrister as a function of the difference between the output voltage of the tacho-generator and the output voltage of the differential transformer so that the yarn of nylon or like material are wound on the spool with a constant tension.

3,670,976
DELIVERY DEVICE FOR THREADS ON WEAVING MACHINES, KNITTING MACHINES, OR THE LIKE

Giuseppe Vischiani, Como, Italy, assignor to Firma Sobrevin Soc. de Brevets Industriels, Mauren, Liechtenstein

Filed April 16, 1970, Ser. No. 29,042
Claims priority, application Germany, June 10, 1969, P 19 29 485.0
Int. Cl. B65h 51/20
U.S. Cl. 242—47.12 6 Claims

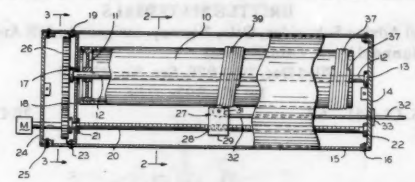


A delivering device for threads on weaving machines, knitting machines, or the like, which comprises a motor and a drum which is rotated by the motor and adapted to store intermediately a predetermined thread supply prior to each thread removal. A thread supply surveillance device is arranged for stopping the motor upon reaching a nominal-thread supply. The motor comprises an asynchronous two-phase motor. A current valve circuit is provided for feeding current to the motor. The surveillance device emits a motor stopping-command signal in both phases in the stopping position, and the current valve circuit is transferred by the command signal for either positive or negative half-waves.

3,670,977
SELF-CONTAINED CABLE REEL

Roger L. Boneck, W-140, N-5550 Lilly Road, Menomonee Falls, Wis.

Filed Sept. 15, 1970, Ser. No. 72,270
Int. Cl. B65h 57/28, 75/00
U.S. Cl. 242—54 R 4 Claims



A self-contained reel unit includes an outer housing having a rotary drum mounted therein. A cable is pulled into the housing and wound upon the drum. A feed screw and cable guide and support member deposits the cable uniformly across the surface of the drum. The feed screw and cable guide reverses to play out the cable as it is unwound from the drum.

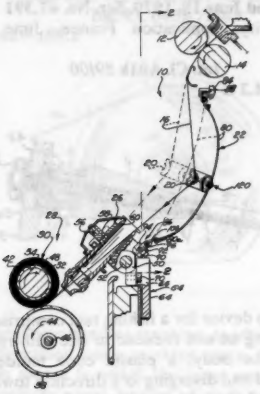
3,670,978
COMPENSATOR DEVICE

Myron Dragisich, Fairview Park, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Oct. 2, 1970, Ser. No. 77,621
Int. Cl. B65h 54/28; D01h 13/06
U.S. Cl. 242—54.4 8 Claims

An improved compensator device is provided to maintain a constant sliver path length between a pair of calender rolls and a reciprocable twister assembly of a balling mechanism. The

compensator device includes a guide through which the sliver passes and a resilient link which carries the guide and flexes to enable the guide to move during reciprocation of the twister.



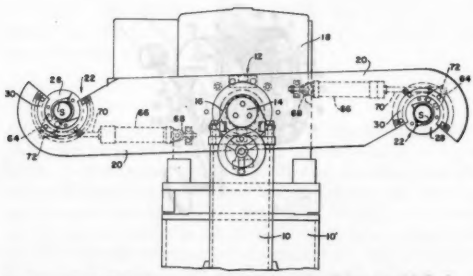
The resilient link is formed by a plurality of flexible strips which extend between a universal joint mounted in a fixed relationship with the calender rolls and a second universal joint which is connected with the twister.

3,670,979

WEB HANDLING APPARATUS AND SPINDLE CHUCK THEREFOR

Philip B. Seay, Richmond, Va., assignor to Inta-Roto, Inc., Richmond, Va.

Filed April 17, 1970, Ser. No. 29,476
Int. Cl. B65h *75/34*
U.S. Cl. 242—64 **10 Claims**



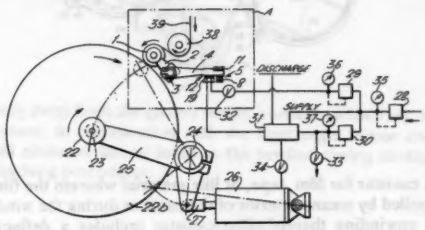
The spindle receiving chuck of a web handling apparatus comprises a holder of arcuate configuration and having a segmental gap therein which is wide enough to permit the passage of a spindle into and from the chuck. The interior of the holder body is spherical and a chuck assembly having a spherical outer surface is rotatably and swively mounted within the holder. The chuck assembly includes a U-shaped yoke and an arcuate segment pivotally connected at one of their respective ends and jointly defining a ring when their other respective ends are in abutment. A crank arm is secured to the ring for rotating it within the holder to move the segment into and from alignment with the segmental gap to permit loading and unloading a spindle, and locking the spindle within the ring. The web handling apparatus has pairs of arms with a spindle chuck carried by each arm to jointly support a spindle between said arms, said holders being positioned with their gaps on the upper sides of the arms in spindle loading position and means being provided to operate both chucks in each pair of arms simultaneously.

3,670,980

APPARATUS FOR CONTROLLING THE CONTACT PRESSURE BETWEEN A CONTACT ROLLER AND A WINDING UP ROLL IN WINDERS

Hideo Mukai, and Kimihiro Wada, both of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Kamitoba, Minami-ku, Kyoto, Japan

Filed July 28, 1970, Ser. No. 58,876
Claims priority, application Japan, July 30, 1969, 44/60221
Int. Cl. B65h *23/00, 17/02*
U.S. Cl. 242—67.1 **5 Claims**



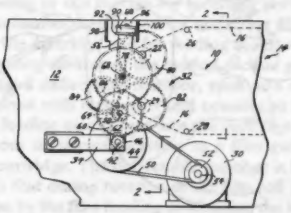
A apparatus for controlling the contact pressure between a contact roller and a winding roller of winding machines includes means for supporting the contact roller in such rigid manner as substantially considered to be a fixed support, means for detecting at the contact roll the contact pressure between the contact roller and winding roller and means for urging the winding roller toward the contact roller to provide a contact pressure therebetween. The pressure detected at the contact roller by the pressure detecting means is fed to a pneumatic control means which operates in response to the detected pressure to automatically regulate the contact pressure applied through the winding roller at a predetermined level.

3,670,981

SELF-REVERSING RIBBON DRIVE

James J. Cavella, Somerdale, N.J., assignor to Datadyne Corporation, King of Prussia, Pa.

Filed May 6, 1970, Ser. No. 34,957
Int. Cl. G11b *15/44*
U.S. Cl. 242—67.4 **14 Claims**

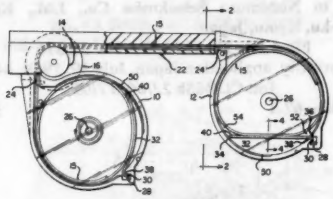


A self-reversing drive mechanism for a ribbon or other web-like article is disclosed. The mechanism includes a pair of spools, spaced to serve alternately as supply and take-up spools, and a driver gear shiftable in response to radial gear tooth forces thereon between positions wherein it is drivingly coupled to first one and then the other of the spools. The radial tooth forces are determined by tension in the ribbon, and reach the values necessary to effect shifting of the driver gear after the ribbon is fully unwound from the supply spool.

3,670,982
FILM CANISTER

James L. Henry, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Dec. 2, 1969, Ser. No. 881,421
Int. Cl. G03b *1/04, 23/06*
U.S. Cl. 242—71.2 7 Claims

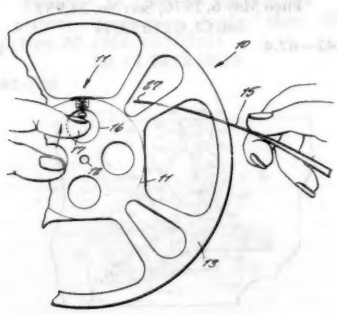


A canister for film, tape, or like material wherein the film is propelled by means exterior of the canister during the winding and unwinding thereof. The canister includes a deflection spring pivotally connected thereto, extending in the free state across a chordal portion of the canister, and adapted to be moved in a direction to conform with the interior surface of the canister wall when film is pressed against the spring upon winding of the film within the canister. The spring is deflected by reason of the increasing pressure of the film loops thereagainst to permit a greater length of film to be coiled inside the canister.

3,670,983
HOLD DOWN CLAMP

Myron E. Osburn, deceased, late of P.O. Box 1455, Enid, Okla. (Lennie McDowell, administratrix)

Filed July 23, 1969, Ser. No. 844,009
Int. Cl. B65h *75/28*
U.S. Cl. 242—74.2 2 Claims

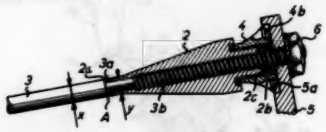


An improved reel upon which film is wound up, the reel including a hold down clamp to which one end of the film is removably secured, the hold down clamp comprising a spring loaded clip under which the end of the film is inserted when the clip is raised manually.

3,670,984
LINE PICK-UP FOR FISHING REELS

Jean-Paul Lemery, Cluses, France, assignor to Carpano & Pons, Cluses, France

Filed June 18, 1970, Ser. No. 47,391
Claims priority, application France, June 20, 1969, 6920777
Int. Cl. A01k *89/00*
U.S. Cl. 242—84.2 G 6 Claims

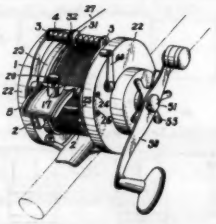


A line pick-up device for a fishing reel comprises a semicircular body having an end reduced in size with respect to the remainder of the body, a plastic cone molded over the reduced-size end and diverging in a direction towards the end tip of the reduced-size end, and line guiding means at the end tip of the reduced-size end and adjacent the base of the plastic cone for guiding a fishing line during winding thereof on the fishing reel. The line guiding means comprises either a fixed or rotatable flared member.

3,670,985
FISHING REEL

Yasomatsu Morishita, Kure, Japan, assignor to Kabushiki Kaisha Ryobi Seisakusho, Hiroshima-ken, Japan

Filed July 10, 1970, Ser. No. 53,950
Claims priority, application Japan, July 16, 1969, 44/68135; July 21, 1969, 44/69170; Aug. 2, 1969, 44/73465
Int. Cl. A01k *89/02, 89/04*
U.S. Cl. 242—84.43 4 Claims



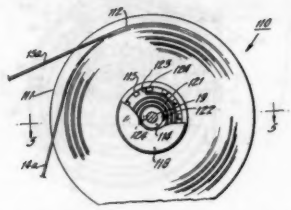
A fishing reel having side plates connected in spacer relation by stems to define a frame for a rotatable spool. A clutch lever on one plate is selectively pivoted to declutch the spool from its crank operated drive. A pair of levers are pivotally mounted intermediate their ends on a rear one of said stems. The forward ends of the levers are connected by a reversely threaded roller means. During winding, a line guiding wheel on the roller has a follower in the roller threads and is caused by the line to rotate and thereby reciprocate the guide wheel along the roller to evenly distribute line on the spool. The rear ends of said levers carry brake shoes. The intermediate portions of the levers are connected by a sleeve having a thumb lever portion depressable against a light spring bias to engage the brake shoes on the lever with the spool to retard rotation of same. To cast, the clutch is disengaged permitting free rotation of the spool while tension in the unwinding line lifts the brake shoe free of the spool until slackness occurs in the line allowing the brake to reengage the spool to prevent undesired overrunning.

3,670,986

SUPPLY REEL FOR BANDING APPARATUS

Robert D. Farkas, 5601 First Avenue, Brooklyn, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,439
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.1 **11 Claims**



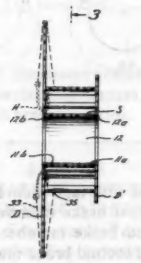
A heat seal type banding machine, in which tapes are fed in opposite directions into a working space, is provided with a tape supply means in which the tapes are double wound so that substantially equal lengths of each tape are dispensed simultaneously. A spring means is provided to constantly exert forces on the tapes, urging them in directions opposite to those directions in which the respective tapes move into the working space of the apparatus. Keying means prevents mounting of the tape supply means in an improper operating position.

3,670,987

TROTLINE STORAGE REEL

James J. Roebuck, P.O. Box 213, Mont Belvieu, Tex.

Filed Nov. 12, 1969, Ser. No. 876,007
Int. Cl. B65h *75/14, 75/28*
U.S. Cl. 242—118.4 **7 Claims**



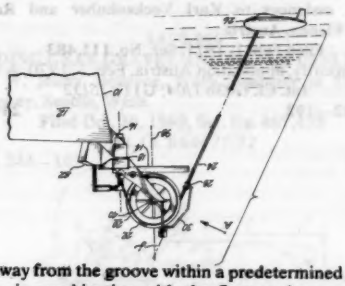
A trotline storage reel for storing a trotline in a coiled position comprising a central spool for receiving the main support line to which individual stagings, which are short lengths of line having a fish hook thereon, are connected to the main support line at longitudinally spaced intervals. The spool is provided with a radially extending flange adjacent one end thereof for supporting the individual stagings in an extended position and a plurality of openings are formed in the flange member for securing the fish hooks therein.

3,670,988

WINCH APPARATUS FOR FAIRED TOWLINE

Donald E. Leonard, Bothell, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 3, 1970, Ser. No. 60,498
Int. Cl. B65h *54/28;* **B63b** *21/56*
U.S. Cl. 242—158 R **10 Claims**



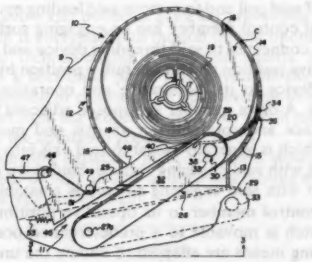
To protect a faired towline against adverse loading, a winch apparatus is provided with a helically grooved drum which is mounted on an assembly that can rotate automatically about a vertical axis upon command from a towline fleet angle sensor means. The helical drum groove has a cross-sectional configuration which allows for lateral bending of the towline, tangentially away from the groove within a predetermined arc, which feature, in combination with the fleet angle sensor control, will minimize lateral loads to the towline during towing and winching procedures.

3,670,989

CARTRIDGE LOADING MOTION PICTURE PROJECTION APPARATUS

Peter Andrews, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed March 18, 1970, Ser. No. 20,507
Int. Cl. G03b *23/02;* **G11b** *15/32;* **B65h** *12/14*
U.S. Cl. 242—192 **12 Claims**



A cartridge for a cartridge-loading motion picture projector has an opening or slot therein for receiving portions of a film feeding mechanism that is used for extracting film from a film roll within the cartridge and for feeding the film to automatic or self threading devices of the motion picture projector. The cartridge has a deflectable member, such as a spring or tongue, positioned with respect to said opening so that entrance of the film feeding mechanism into the cartridge deflects such member from its normal position to a film guiding position within the cartridge. The deflectable member is located in the cartridge so that during rotation of the film roll in an unwinding direction by the film feeding mechanism the leading end of the film engages the member and is guided by it to a tip end of a film engages the member and is guided by it to a tip end of a film stripping finger. The finger then lifts the leading end of the film from the roll and delivers it through a guide slot or channel to automatic threading devices of the projector. The apparatus of this invention also comprises improved film feeding mechanisms that are useful with the cartridge disclosed herein as well as with other cartridges. Such film feeding mechanisms comprise means for deflecting the deflectable member as the mechanism enters the film cartridge, and means for narrowing the normal slot or channel between a film drive belt and the film stripping member, thereby to improve film feeding operations of the mechanism and to deliver

film from the device properly oriented for reception by an automatic threading device of the projector.

3,670,990

STRIP-HANDLING APPLIANCE FOR PROCESSING INFORMATION

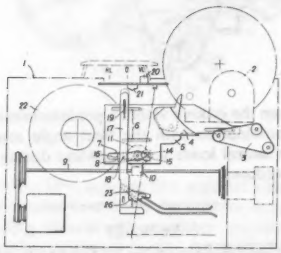
Gottfried Pammer, Sudstadt, and Erwin Krob, Vienna, both of Austria, assignors to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed Feb. 1, 1971, Ser. No. 111,483

Claims priority, application Austria, Feb. 3, 1970, A 980/70

Int. Cl. G03b *1/04;* **G11b** *15/32*

U.S. Cl. 242—192 **24 Claims**



Strip-handling means are provided for handling a record strip forming a coil on a spool and having a leading end on the outside periphery of said coil. A threading device is movable between an inoperative position and an operative position and is adapted in said operative position to engage the outside periphery of said coil and to remove said leading end from said coil. A final control member has an engaging surface and is operatively connected to said threading device and slidable to an inoperative position and an operative position to move said threading device to its inoperative and operative positions, respectively. A drive member is disposed adjacent to said engaging surface and rotatable on an axis and movable in a direction which is generally radial to said axis into and out of engagement with said engaging surface. Said drive member in engagement with said engaging surface is rotatable to move said final control member to its operative position. A mode control switch is movable to a predetermined position. The strip-handling means are adapted to initiate the unwinding of said strip from said coil when said switch is in said predetermined position. An intermediate control member is operatively connected to said switch and said drive member and arranged to move the latter into engagement with said engaging surface in response to a movement of said switch to said predetermined position.

3,670,991

CARTRIDGE MOUNTING STRUCTURE FOR A CARTRIDGE LOADING MOTION PICTURE PROJECTOR OR THE LIKE

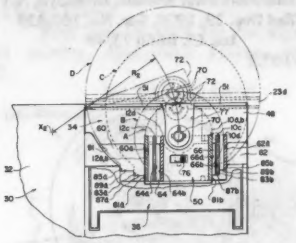
Daniel J. Stark, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed April 23, 1970, Ser. No. 31,183

Int. Cl. G03b *1/04;* **G11b** *15/32, 23/04*

U.S. Cl. 242—197 **8 Claims**

A cartridge loading motion picture projector has a spindle that is movable along an arcuate path to each of several positions wherein it is adapted to be engaged with a reel within one of several sizes of cartridges that are mountable on the projector. Each of the cartridge sizes has similar locating structures, the projector spindle is received through openings in the cartridges. The openings and locating structures are positioned with respect to each other so that the openings are located along a second arcuate path if the cartridges are superimposed with their locating structures in alignment. The projector has cartridge mounting structure for positioning each of the similar locating structures on the cartridges at different positions on the projector so that the openings in the cartridges are located along the path of travel on the spindle.



3,670,992

REEL BRAKE DEVICE FOR TAPE RECORDER

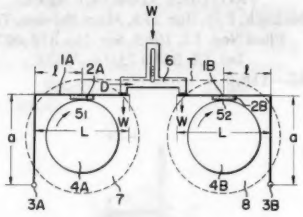
Takeshi Goshima, and Nobuhiro Imai, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 14, 1970, Ser. No. 71,866

Claims priority, application Japan, Sept. 26, 1969, 44/91783

Int. Cl. B11b *15/32;* **G03b** *1/04*

U.S. Cl. 242—204 **13 Claims**



A brake device used with tape recorders or the like of this invention includes a first brake member acting in the cut-in direction and a second brake member acting in the escape direction, the first and second brake members being disposed adjacent to braked members provided on the take-up and supply sides, respectively. Two brake members are selectively operable so that the selected brake member may act solely in the escape direction irrespective of the rotational direction of the braked members, whereby brake force can be exerted solely in the escape direction without erroneously breaking or severing a tape or the like running between the supply and take-up sides.

3,670,993

COMPACT HIGH CAPACITY BURNER FOR HOT AIR BALLOONS

Byron L. Kay, and Walter H. Thurn, Jr., both of Akron, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

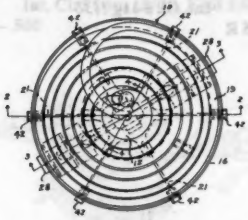
Filed Oct. 12, 1970, Ser. No. 79,784

Int. Cl. B64b *1/62*

U.S. Cl. 244—32 **2 Claims**

A burner for a hot air balloon having a conically shaped preheat coil supported by and spaced from a substantially conical shaped flame deflector. A manifold, with a plurality of radially positioned holes which direct the flame toward the flame

deflector, is connected to the preheat coil so that fuel is supplied to the manifold through the preheat coil. Air is supplied through holes in the manifold support. Igniters, operated by



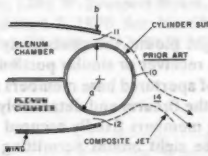
the pressure of the fuel supplied to the preheat coil, direct a starting flame into the space between the flame deflector and the preheat coil.

3,670,994

VARIABLE DEFLECTION THRUSTERS FOR JETS

Apostolos P. Kizilos, Minnetonka, Minn., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 13, 1970, Ser. No. 63,369
Int. Cl. B64c *21/04*
U.S. Cl. 244—42 CC **2 Claims**



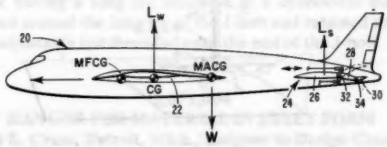
Variable deflection thrusters center body of improved design for jets for overcoming stream detachment at high mach numbers and high pressure ratios.

3,670,995

LONGITUDINAL STABILITY CONTROL DEVICE FOR FIXED WING AIRCRAFT

Edward J. Swearingen, San Antonio, Tex., assignor to Swearingen Aviation Corporation, San Antonio, Tex.

Filed May 20, 1970, Ser. No. 38,987
Int. Cl. B64c *17/02*
U.S. Cl. 244—80 **9 Claims**



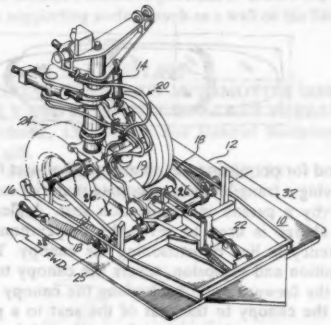
This device permits the aft center of gravity loading limit of an aircraft to be increased beyond its normal range without reducing the location of the most forward center of gravity loading limit. The means by which this is accomplished comprises an elongated spring member which has one end connected to the underside of the elevator control surface and which has its other end connected to a spring tension adjusting linkage mounted in the aircraft. The adjusting linkage causes the spring to pull the elevator downwardly to increase the nose down pitching moment about the center of gravity of the aircraft when the device senses a nose up pitch attitude, and releases the tension in the spring in response to a nose down condition. The device includes a feedback member which acts to relocate the spring member to hold the elevator in the desired position in order to trim the aircraft for a given center of gravity and airspeed.

3,670,996

LANDING GEAR GRAVEL AND WATER DEFLECTOR

Robert W. Jenny, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 20, 1969, Ser. No. 867,473
Int. Cl. B64c *25/32*
U.S. Cl. 244—103 **12 Claims**



A gravel and water deflector plate for preventing gravel and water, which is energized into motion during operation of the landing gear, from damaging other airplane parts. The plate is mounted in a horizontal plane and surrounds the wheel adjacent the ground or runway. The plate extends in all horizontal directions from the wheel for distances which are sufficient to intercept the upthrown gravel trajectories.

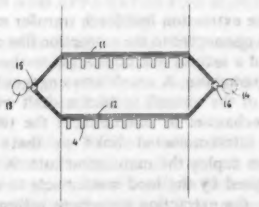
In addition, the deflector plate may be a separate operational element or may also be utilized as a closing door for the landing gear well during flight.

3,670,997

AIRCRAFT ARRESTING DEVICE

Per Borje Fonden, Hejdezatan 3, and Karl Ove Torgny Walander, Elas Brandstrom gata #5, both of Linkoping, Sweden

Filed Dec. 11, 1969, Ser. No. 884,157
Claims priority, application Sweden, Dec. 13, 1968, 17101/68
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 C **3 Claims**



An arrangement for arresting landing aircraft in which a cable is usually disposed in the path of the aircraft, the present invention comprising a plurality of parallel cables instead of a single cable, said cables being normally disposed below the

surface of the landing field and being capable of being lifted one at a time or lifted together or in other arrangements and numbers, to the raised arresting position.

3,670,998

SEVERANCE OF POLYCARBONATE MATERIAL CANOPY TRANSPARENCY

Joseph L. Charleville, Kirkwood; Mart E. De Tienne, St. Louis County, and Charles W. Lammert, St. Charles, all of Mo., assignors to The United States of America as represented by the Secretary of the Air Force

Filed July 10, 1970, Ser. No. 53,727
Int. Cl. B64c 1/14
U.S. Cl. 244—121 **1 Claim**

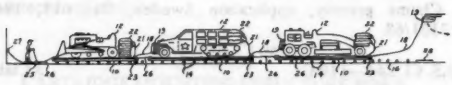
Method for permitting the emergency bail-out from an aircraft having a frangible polycarbonate material canopy transparency by a person in an ejection seat. A flexible linear shaped charge is used to sever the polycarbonate canopy transparency in lieu of jettisoning the canopy. The charge, after ignition and explosion, severs the canopy transparency around the forward arch, back along the canopy side frame, and up the canopy to the rear of the seat to a point which leaves an unsevered section, of preselected length, of the canopy transparency. This unsevered section serves as a hinge and as a retaining means, and as the seat is ejected from the aircraft the severed section of the canopy transparency moves backwardly away from the seat, thereby precluding any contact between the canopy transparency and the person in the ejection seat.

3,670,999

PARACHUTE FORCE TRANSFER MECHANISM WITH BUILT-IN OPEN LINK

James E. Leger, Enon, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 5, 1970, Ser. No. 87,216
Int. Cl. B64c 1/22; B64d 1/08
U.S. Cl. 244—137 **6 Claims**



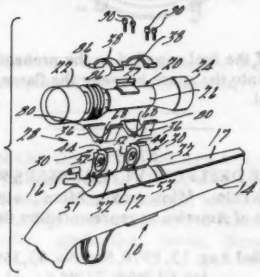
A parachute extraction line force transfer mechanism having a first link connected to the extraction line of an extraction parachute and a second link connected to the extraction line of the main parachute. A crank arm engages tripping fixture on the floor of the aircraft to turn a shaft with cams which operate a mechanism to interconnect the two links and to release the interconnected links so that the extraction parachute can deploy the main parachute. A solenoid which can be energized by the load master acts to release the link connected to the extraction parachute without releasing the link connected to the main parachute. Disconnect type terminal blocks act to connect the solenoid of only the aft most platform to the power supply to prevent the releasing of the extraction parachute link without the main parachute link after the platform has moved a predetermined distance.

3,671,000

SIGHT-THRU TELESCOPIC SIGHT MOUNT

Paul D. Williams, Davison, Mich., assignor to Williams Gun Sight Co., Davison, Mich.

Filed June 12, 1970, Ser. No. 45,841
Int. Cl. F41g 1/38
U.S. Cl. 248—205 R **5 Claims**



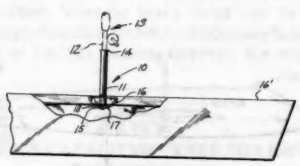
A telescopic sight mount for operatively securing a telescopic sight to the receiver or similar portion of a firearm and comprising a pair of apertured base members adapted to be installed directly on the firearm and detachably support pairs of split ring retaining members fixedly secured to an associated telescopic sight, the sight mount permitting use of standard "iron" sights on the firearm without requiring removal of the telescopic sight and providing a new and improved means for conveniently interchanging telescopic sights.

3,671,001

FISHING ROD HOLDER FOR BOATS

Harold H. Hall, Sr., 1975 Ocala Road, North Palm Beach, Fla.

Filed April 16, 1970, Ser. No. 29,032
Int. Cl. A01k 97/10
U.S. Cl. 248—43 **1 Claim**



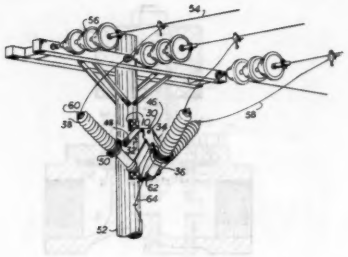
A device for supporting a fishing rod on a boat while the rod is unattended. This device includes a sleeve portion for receiving the butt of the fishing rod, the other end having an extension that will be received within the oar lock of the boat. The device also includes a pivotable member for preventing the device from coming out of the oar lock and falling overboard.

3,671,002

TRIPLE ARRESTOR MOUNT

Ernest A. Elliott, Detroit; John W. Kane, Pontiac, and Randolph A. Pasen, Dearborn Heights, all of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed Aug. 13, 1970, Ser. No. 63,477
Int. Cl. F16m 13/02; F16l 3/08
U.S. Cl. 248—300 7 Claims



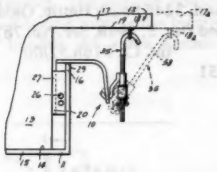
A mount designed for attachment to a stand-off insulator bracket having three downwardly and outwardly diverging legs provided with means adjacent their lower ends to support three elongated arrestors in laterally spaced upwardly and outwardly diverging relation.

3,671,003

CAMPER HOLD-DOWN BRACKET

Samuel H. Henson, 1201 W. Prospect Street, Kewanee, Ill.

Filed Sept. 2, 1970, Ser. No. 68,914
Int. Cl. B60p 3/32; B65j 1/22
U.S. Cl. 248—361 R 3 Claims



A bracket for attaching camper bodies to truck beds equipped with stake pockets wherein the bracket includes a portion extending into the stake pocket for attachment thereto and an outwardly and downwardly extending plate attached to the top of the stake pocket received portion, the plate terminating in a portion having apertures therethrough and a connecting member for adjustable positioning between the apertures and a camper body carried bracket, the connecting member including a J-bolt having its long leg threaded and a hook having a long leg attached to a cylindrical member received around the long leg of the J-bolt and retained thereon by an adjustable nut threaded onto the end of the J-bolt.

3,671,004

HANGER FOR MATERIAL IN SHEET FORM

Robert S. Cram, Detroit, Mich., assignor to Design Creations, Inc., Detroit, Mich.

Filed Sept. 4, 1970, Ser. No. 69,825
Int. Cl. A47g 1/16
U.S. Cl. 248—467 1 Claim

A hanger for decorative sheet material such as posters, pictures, record covers and the like, comprises a channel member of generally U-shaped cross-section having a longitudinal opening or slot at one side thereof defined by inwardly bent, oppositely towards each other inclined tabs extending from the ends of the leg portions of the U-channel member which clamp the sheet material in between them or permit their engagement with a hook provided on the sheet material over a

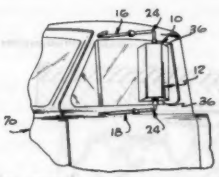
selected tab for support of the sheet material. Selectively, one side of the U-channel type hanger member maybe provided with pressure sensitive adhesive portions to secure the hanger member to a supporting surface such as a wall or the like.

3,671,005

SIDE MOUNTED REAR VIEW AUTOMOTIVE MIRROR ASSEMBLY AND MOUNTING BRACKET THEREFOR

Odetta B. Schultz, 1326 South San Gabriel Boulevard, San Gabriel, Calif.

Filed Oct. 15, 1970, Ser. No. 80,883
Int. Cl. B60r 1/04
U.S. Cl. 248—480 7 Claims



A side mounted rear view automotive mirror assembly including a mirror frame and mounting brackets at the frame ends having support arms extending transversely of the frame, pivoted bracket members at one end of the arms for attachment to the side of an automotive vehicle, and coupling means, such as L-shaped coupling members, at the opposite ends of the arms rotatably and telescopically joining the arms and frame in the manner which permits angular adjustment of the frame about its longitudinal axis as well as about a transverse axis generally parallel to the bracket support arms, endwise adjustment of the frame along its longitudinal axis, lateral adjustment of the frame lengthwise of the bracket arms, and installation of mirror frames of different sizes and shapes. A mounting bracket for the mirror assembly.

3,671,006

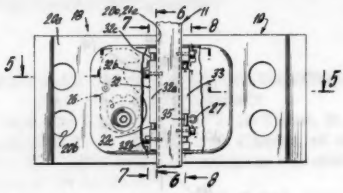
REFRIGERATOR WALL PANELS WITH PANEL FASTENERS AND APPARATUS FOR MAKING SAID PANELS

Irving L. Berkowitz, Binghamton, N.Y., assignor to Kason Hardware Corporation, Binghamton, N.Y.

Filed July 1, 1970, Ser. No. 51,635
Int. Cl. B22d 19/04
U.S. Cl. 249—97 20 Claims

The panels are molded. Frame members for the edges of the panel are assembled with thin, parallel spaced side walls, and with complementary panel, hook and pin fastener members in registry with appropriate openings or slots in the frame members, ro form the molds for the panels. Fixtures are provided to properly align each panel hook fastener member molded into one panel with a complementary panel pin fastener member molded into another panel fastener. These fixtures

cut down the time necessary for positioning the panel fastener members preparatory to molding, and to ensure proper posi-



tioning of the fasteners in correct positions so that each hook fastener member matches exactly with a complementary pin fastener member.

3,671,007

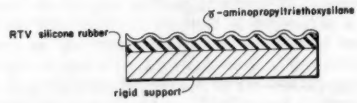
COATED SILICONE RUBBER MOLD

James L. Bailey, Dover, and Franklin A. Rodgers, Brookline, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 788,707, Jan. 3, 1969, Pat. No. 3,620,895. This application Dec. 7, 1970, Ser. No. 95,478

Int. Cl. B29d 1/04

U.S. Cl. 249—114 **2 Claims**



A mold comprising a support, a silicone rubber layer of predetermined configuration and a layer of γ-aminopropyltriethoxysilane.

3,671,008

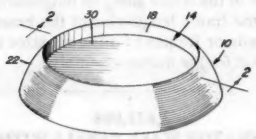
FOOD MOLD

Fred A. Villalba, Jr., 9100 Rex Court, El Paso, Tex.

Filed Aug. 28, 1970, Ser. No. 67,938

Int. Cl. A23g 1/22, 3/12, 3/18; F25c 7/20

U.S. Cl. 249—155 **2 Claims**



A tortilla mold comprising a frame defining a central circular molding cavity which contains a vertically adjustable base disk for varying the thickness of the molded tortilla. The frame includes a series of sockets in the bottom of the mold cavity which receive downwardly projecting guides on the undersurface of the disk for guiding the vertical adjustment of the disk which is effected by several adjusting screws extending upwardly into the disk guides through the bottom of the frame. Gauge marks are associated with each screw so as to visionally indicate the adjustment of the disk. The wall of the molding cavity is circular and smooth, terminating in an upward cutting edge. The mold receives a thin overlayer of plastic within which the cornmeal is pressed, cut and formed.

3,671,009

FLUID-CONTROLLING VALVE

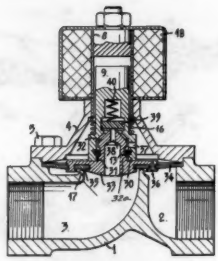
Harald Stampfli, Petit-Saconnex, Switzerland, assignor to Lucifer S.A., Carouge-Geneva, Switzerland

Filed March 20, 1970, Ser. No. 21,336

Claims priority, application Switzerland, April 15, 1969, 163/70; Jan. 8, 1970, 164/70

Int. Cl. F16k 31/06

U.S. Cl. 251—129 **1 Claim**



An electromagnetically controlled valve, wherein the closure-member is connected with the movable core of the controlling electromagnet in a simple and smooth manner by means of a coupling the members of which are rigid respectively with the core and with the closure-member, one of said members housing with a clearance the other member and defining with the latter a space inside which an O-ring is held with an axial clearance. Said O-ring fitted in an annular groove extending outwardly of the housing transmits the motion of the core to the closure-member so as to raise it off its seat.

3,671,010

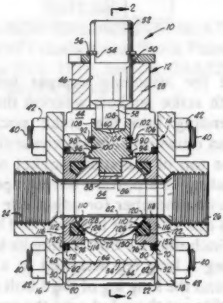
VALVE ASSEMBLY WITH DROP-TYPE STEM

Domer Scaramucci, 3245 South Hattie, Oklahoma City, Okla.

Filed Dec. 5, 1968, Ser. No. 781,310

Int. Cl. F16h 51/00

U.S. Cl. 251—151 **43 Claims**

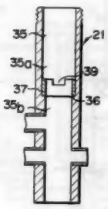


A valve assembly, particularly useful between flanges, which utilizes a housing unit and a separate valve unit. The housing unit provides a supporting housing adapted to be supported between the flanges and to include a valve operator and a first valve stem. The valve unit is sized to be inserted in the housing unit and includes the valve member, seats, and at least one additional valve stem. The valve stem carried by the housing unit is insertable lengthwise into connection with the valve stem of the valve unit. In an assembled position, the valve unit is sealed against the flanges and prevents the housing unit from being contacted by fluid controlled by the valve.

3,671,011
VALVE ASSEMBLY FOR CORNETS, TRUMPETS AND LIKE INSTRUMENTS

Yukihiro Oguma, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Dec. 4, 1970, Ser. No. 95,039
Claims priority, application Japan, Dec. 5, 1969, 44/115354
Int. Cl. G10d *9/04*; **F16k** *3/26*
U.S. Cl. 251—323 **3 Claims**



A valve assembly comprises a valve cylinder and a piston valve slidable in the cylinder. The cylinder is formed of a one-piece tubular body and has a cylindrical bore formed therein, the bore being divided into two sections one of which is larger in diameter than the other so as to form an annular step therebetween. A tubular collar is tightly fitted in the bore so as to seat on the step and has a pair of cut-out portions formed at an annular edge thereof. The cut-out portions receive both ends of a guide member permitting the lengthwise movement of the valve and holding the valve against turning in the cylinder.

3,671,012
GREASE COMPOSITIONS CONTAINING POLYMERS

William P. Scott, and Lynn C. Rogers, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed March 16, 1970, Ser. No. 20,039
Int. Cl. C10m *5/22*
U.S. Cl. 252—33.4 **15 Claims**

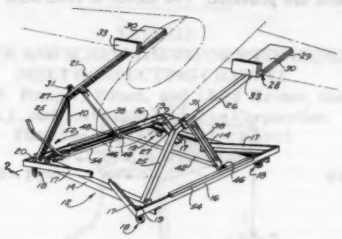
This disclosure concerns compositions comprising a major amount (e.g. at least 75 weight percent) of a thixotropic, grease-like composition consisting essentially of a nonvolatile diluent oil, an oil-soluble dispersing agent, an alkaline earth metal carbonate and a minor amount (e.g. 0.1 to 25 weight percent) of a polymer. The composition is particularly useful as a lubricating grease and also is useful as a rust inhibitor.

3,671,013
AIRCRAFT HANGARING SUPPORT

Kirke B. Everson, Jr., R.F.D. 2, P. O. Box 471, and Stefan F. Eisen, R.F.D. 2, P. O. Box 516, both of Danielson, Conn.

Filed May 25, 1970, Ser. No. 40,095
Int. Cl. B60p *1/48*
U.S. Cl. 254—8 R **5 Claims**

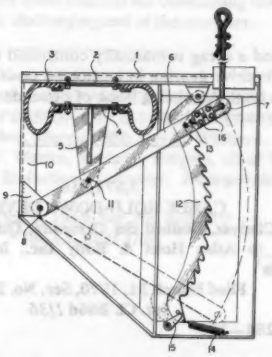
An aircraft hangaring support having a base framework mounted on rollers, the framework having pivotally attached thereto arms carrying aircraft wing engaging means, the arms being mechanically pivoted to raise the aircraft fuselage by the wings.



3,671,014
DEVICE FOR FASTENING OF LOAD

Gote Sixten Karlsson, Masugnsbyn, Sweden

Filed Nov. 19, 1969, Ser. No. 878,040
Claims priority, application Sweden, Nov. 21, 1968, 15837/68
Int. Cl. B66f *1/00*
U.S. Cl. 254—51 **10 Claims**



A device for tensioning and fastening a flexible elongated member, such as a chain or wire. A frame has a pressure bellows and a lever mounted thereon. The pressure bellows is operatively connected to the lever by a shank member whereby the stroke of the pressure bellows is multiplied by the leverage ratio of the lever so that the free end of the lever goes through a increased stroke to tension a flexible elongated member attached to the free end of the lever.

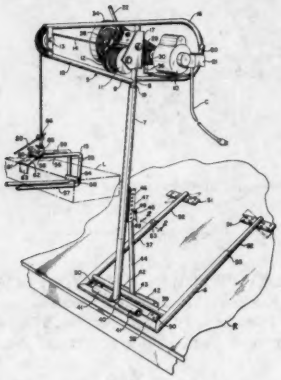
3,671,015
PORTABLE HOISTING UNIT

Gene F. Sullivan, Dubuque, Iowa, assignor to Howard W. Brown, Dubuque, Iowa

Filed Feb. 26, 1970, Ser. No. 14,493
Int. Cl. B66c *23/60*
U.S. Cl. 254—142 **7 Claims**

A foldable base structure has a base frame that is fastened to a roof or other deck and a standard that is pivoted on the frame is raised to a substantially vertical position, in which it is rigidly supported by a brace pivoted at its one end to the frame and fastenable at its other end to the standard. A separate removable crane unit has a post which telescopes in the standard, and swivels relative thereto, and it carries a motor and a winch driven thereby on its upper end in nicely balanced rela-

tionship to the post, the hoisting line extending from the winch over a pulley on the outer end of the frame in which the motor and winch are provided. The motor is reversible by manual



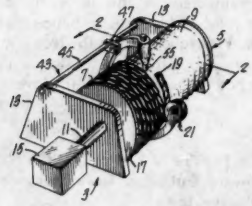
control and a sprag is manually controlled to lock the winch through its drive gearing in a selected position for safer handling of a load. A hoisting hook of novel design is attached to the line to carry the load.

3,671,016

CABLE HOLD-DOWN DEVICE

Wiktor Gladysz, Dollard des Ormeaux, Quebec, Canada, assignor to Atlas Hoist & Body Inc., Montreal, Quebec, Canada

Filed March 31, 1970, Ser. No. 24,098
Int. Cl. B66d *1/36*
U.S. Cl. 254—190 **7 Claims**



A cable hold-down device comprising a frame which can be positioned to extend adjacent and about a portion of the circumference of a cable drum. The frame carries a rotatable pulley to press against the last section of cable wound on the drum. The frame rides on the drum and has means for biasing the pulley against the cable.

3,671,017

FENCE DROPPER

Roger Norman Sachs, Brisbane, Queensland, Australia, assignor to National Nail Pty. Ltd., Mayne Junction, Brisbane, Queensland, Australia

Filed June 8, 1970, Ser. No. 44,036
Int. Cl. E04h *17/02*
U.S. Cl. 256—47 **2 Claims**

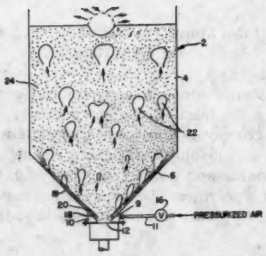
A wire fence dropper with top and bottom grips for engaging top and bottom wires of a fence has intermediate catches for intermediate fence wires, each catch being two opposite U-bends one above the other, interconnected by a transverse S-bend in one curve of which the fence wire seats.

3,671,018

BUBBLE-BLENDING PARTICULATE SOLIDS

Charles W. McKibben, Grove, Okla., and Robert C. Robinson, La Marque, Tex., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 19, 1970, Ser. No. 91,030
Int. Cl. B01f *13/02*
U.S. Cl. 259—4 **11 Claims**



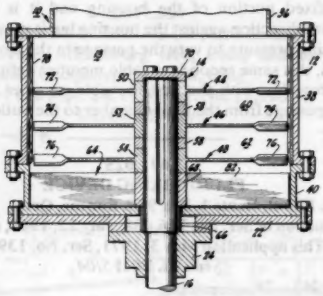
Particulate solids such as normally solid polymer particles can be blended to achieve complete homogeneity in a storage vessel containing a volume up to about 10,000 cubic feet of resin by rapidly introducing gas bubbles at the base of the vessel. The gas is introduced through nozzles protruding from a plenum located at the bottom of the vessel with the nozzle orifices located parallel to the vessel walls adjacent to the plenum.

3,671,019

APPARATUS FOR MATERIAL FLUFFING

Jesse J. Tapscott, and Harold T. Andersen, both of Santa Rosa, Calif., assignors to Rietz Manufacturing Co., Santa Rosa, Calif.

Filed Dec. 10, 1970, Ser. No. 96,724
Int. Cl. B01f 7/22, 7/26
U.S. Cl. 259—8 10 Claims



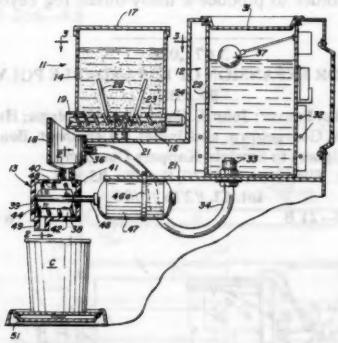
Apparatus for the fluffing, delumping, pulping, or blending of various materials (e.g. moist fibrous filter or press cake). The infeed material is advanced through a fluffing chamber by a rotor having fluffing discs. A scuff plate surrounding the rotor is provided with rows of projections which create high turbulence in the air column carrying the material. The material is momentarily retained in dwell regions in the chamber for agitation.

3,671,020

APPARATUS FOR PRODUCING A BEVERAGE BY MIXING A POWDERED BASE INCLUDING SUGAR AND A COLD LIQUID

Donald E. Krup, Elgin, Ill., assignor to Karma Division of Brandt Automatic Cashier Company, Addison, Ill.

Filed Oct. 9, 1970, Ser. No. 79,391
Int. Cl. B01f 7/04
U.S. Cl. 259—10 3 Claims



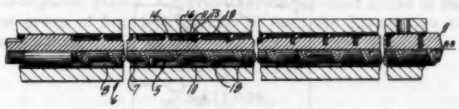
An apparatus for mixing and vending beverages made from a mixture of a water soluble powder admixed with granulated sugar or other non-readily dissolvable sweetener agent and cold water. The apparatus includes a powder dispensing assembly and water dispensing assembly each discharging predetermined quantities of powder and water into a pre-mixing chamber and thence to a final mixing chamber which includes an agitating blade. Disposed in the chamber is a helically wound wire member which serves to shift the undissolved powder and sugar back to the inlet end of the chamber to be mixed by the agitator blade for blending with the water.

3,671,021

EXTRUDER AND SCREW THEREFOR WITH UNDERCUT MELT CONDUCTING CHANNEL

Anthony W. Pomper, Edison, and Lloyd Kovacs, Somerset, both of N.J., assignors to Midland-Ross Corporation

Filed Aug. 26, 1970, Ser. No. 66,915
Int. Cl. B01f 7/02; B29f 3/02
U.S. Cl. 259—109 9 Claims



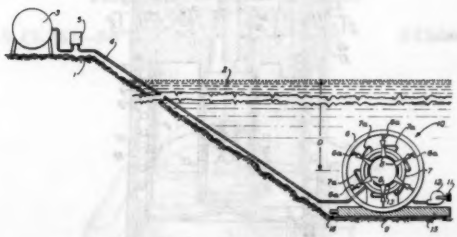
A screw type extruder for reducing a solid thermoplastic material to a fluid wherein a spiral body of uniform width of the material is maintained in continuous contact with the barrel of the extruder and the screw is formed with a secondary or subchannel arranged substantially underneath a solid body supported within the main channel for conducting the melted material toward the discharging end of the extruder.

3,671,022

METHOD AND APPARATUS FOR THE MICRODISPERSION OF OXYGEN IN WATER

William Burton Laird, Murray Hill; Roy L. Williams, Millington, and Allen V. Muska, Berkeley Heights, all of N.J., assignors to Air Reduction Company, Incorporated, New York, N.Y.

Filed Oct. 6, 1969, Ser. No. 863,870
Int. Cl. B01f 3/04
U.S. Cl. 261—29 17 Claims



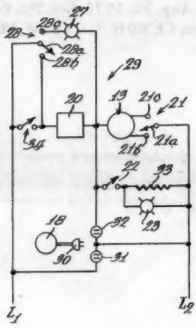
Method and apparatus are disclosed for oxygenating river water or the like. According to the invention a localized flow of water is established beneath the surface of the river, e.g. by impelling water at the river bottom through a conduit. Simultaneously, small volumes of water are mixed with oxygen at pressures under the river, and are immediately injected into the localized flow whereby the minute oxygen bubbles therein are dispersed before substantial agglomeration of bubbles can occur.

3,671,023

HUMIDIFIER

Lewis W. Seil, Grayslake, Ill., assignor to Cory Corporation

Filed Feb. 12, 1970, Ser. No. 10,814
Int. Cl. B01f *3/04*
U.S. Cl. 261—26 **3 Claims**



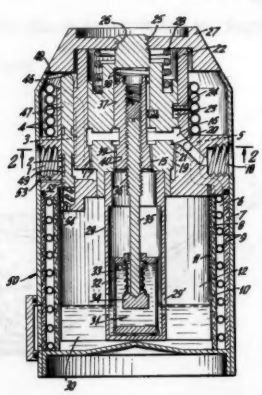
A humidifier having a belt, means for moisturizing the belt, means for moving air against the belt and delivering air moisturized thereby to the ambient atmosphere, and means for selectively driving the belt *a* whenever the air moving means is operated, or *b* continuously.

3,671,024

EXPANSION TEMPERATURE SENSING MEANS, IN PARTICULAR FOR MEDICAL APPARATUS

Hans Georg Breiling, Gross Gronau, Germany, assignor to Dragerwerke Aktiengesellschaft, Lubeck, Germany

Filed April 30, 1970, Ser. No. 33,361
Claims priority, application Germany, May 2, 1969, P 19 22 403.4; May 2, 1969, P 19 22 404.5
Int. Cl. B01f *3/04*; A61m *17/00*
U.S. Cl. 261—39 R **6 Claims**



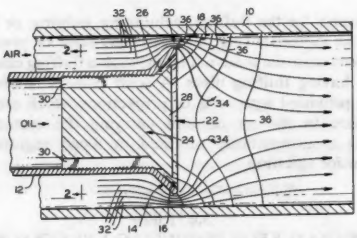
A temperature responsive device for controlling the flow of fluid particularly for medical devices, such as a breathing apparatus and a vaporizer for anaesthetics, comprises a housing which has a supply inlet for the gas and includes a chamber at its lower end which is adapted to contain a liquid such as an anaesthetic. The interior of the housing defines a first pressure compensating passage for the gas in which a part of the inflow of the gas flows through a spiral around a top portion of the housing and then down to a lower spiral defined around the fluid chamber for the liquid, such as the anaesthetic. A second partial gas flow passage extends in the form of a by-pass from the inlet through a valve passage to the outlet. Flow from the fluid chamber to the discharge are regulated by means of two concentric rearranged movable valve members, the first valve member containing the expansible means which is located in the anaesthetic material includes a surface which is spaced from a valve surface of the second movable member and which defines the flow passage from the fluid chamber to the outlet. The second movable member defines a flow passage with a fixed portion of the housing and it is biased in a downward direction against the housing but is movable against this biasing pressure to vary the passage in the by-pass line. In addition, this same second movable member defines a surface which, together with the first movable member, defines the control passage from the fluid chamber to the outlet.

3,671,025

FLUID MIXING DEVICE

Perry R. Elliott, Route 1, Box 950, Eugene, Oreg.

Continuation of Ser. No. 746,438, July 22, 1968, abandoned.
This application May 3, 1971, Ser. No. 139,931
Int. Cl. B01f *5/04*
U.S. Cl. 261—76 **11 Claims**



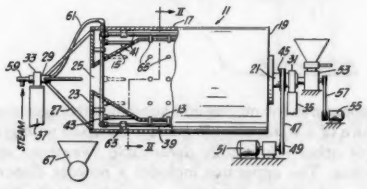
A fluid mixing device suitable for oil burner use comprises an outer cylindrical tubular member and an inner cylindrical tubular member provided with a flared bell at one end thereof. The outer peripheral lip of the bell has a diameter thereacross which is at least half the inner diameter of the outer tubular member, for defining a narrow annular venturi orifice of substantially constant radial dimension. Air flowing in the outer tubular member increases in velocity and decreases in pressure at the orifice for drawing oil from the inner tubular member in order to produce a finely mixed fog beyond the flared bell.

3,671,026

DEVICE FOR EXPANSION OF EXPANDABLE POLYMER BEADS

Frank J. Mills, Beaver; John T. Sadowski, Aliquippa; Harwood H. Squires, Georgetown, and James J. Uebelhart, Beaver, all of Pa., assignors to Sinclair-Koppers Company

Filed Nov. 2, 1970, Ser. No. 85,841
Int. Cl. F27b *15/00*
U.S. Cl. 263—21 B **6 Claims**



An apparatus is provided wherein large low-density interlocking particles are made by expanding thermoplastic

polymer beads containing a normally liquid organic blowing agent. The beads are expanded by heating to the temperature of expansion with steam in a rotating tube. Gentle agitation is provided by a combination of the tumbling action of the rotating tube and the action of the steam rising through the expanding beads. The resultant uniformly expanded particles are not crushed or shredded. The particles are suitable for use in loose-fill packaging of shock-sensitive materials.

3,671,027

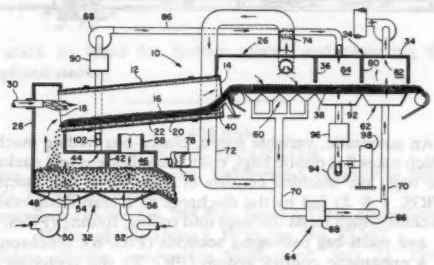
HEAT PROCESSING OF MINERALS

Robert D. Frans, Middleburg Hts., Ohio, assignor to The Hanna Mining Company, Cleveland, Ohio

Filed Sept. 24, 1970, Ser. No. 75,090

Int. Cl. F27b 7/02

U.S. Cl. 263—32 R **7 Claims**



Heat processing apparatus of the type including a rotary kiln, drying and preburning sections at the material inlet end to pretreat the material prior to burning in the kiln, and a cooler at the discharge end of the kiln. The drying section is divided into two in-series chambers, with hot gases from the preburning section circulated through the first such chamber and from the cooler through the second chamber.

3,671,028

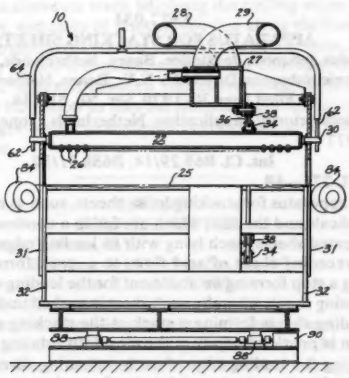
QUENCH SYSTEM FOR PIPES

Klaus H. Hemsath, Sylvania, Ohio, assignor to Midland-Ross Corporation, Toledo, Ohio

Filed Jan. 18, 1971, Ser. No. 107,082

Int. Cl. C21d 1/62

U.S. Cl. 266—6 S **12 Claims**



A quench system for pipes in which jet streams of quench liquid are directed against only the outside surface of an open ended pipe as it passes therethrough. The jet stream nozzles are designed to deliver solid jet streams and are arranged in parallelly spaced apart and coaxially disposed annular groups. The nozzles of each group are directed so that the axes of their jet streams lie in a single plane that is perpendicular to the pipe axis. The axes of the jet streams of each group are also uniformly and adjustably offset or angled with respect to radial lines extending from the pipe axis. The jet streams of a planar group become confluent on the surface of the pipe and the confluent portion has centrifugal components of force which induce the quench fluid to separate from the surface of the pipe. This arrangement enables the spent quench fluid to be expelled through the space between the planes of the incoming jet streams without accumulation of quench fluid from non-adjacent planes. A barrier may be provided ahead of the first group of liquid jet nozzles to limit the frontal flow of quench fluid.

3,671,029

FURNACE FOR NON-FERROUS METALS

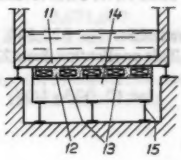
Karl Gosta Karlsson, and Jan Olof Gustaf Bostedt, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 8, 1970, Ser. No. 44,229

Claims priority, application Sweden, June 24, 1969, 8928/69

Int. Cl. C21c 7/00

U.S. Cl. 266—34 A **2 Claims**



A furnace for non-ferrous metals or alloys is provided with a base supporting the furnace. Under the bottom, but supported by the base are arranged at least one electromagnetic stirrer of multiphase type.

3,671,030

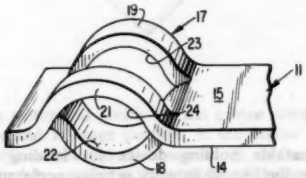
SPRING LEAF AND METHOD OF MAKING

John P. Marion, Valparaiso, Ind., assignor to North American Rock Corporation, Pittsburgh, Pa.

Filed June 1, 1970, Ser. No. 42,289

Int. Cl. F16f 1/18, 1/26

U.S. Cl. 267—54 **5 Claims**



A vehicle spring leaf has at least one of its opposite ends formed with closed eyes for connection to frame or shackle pivots. The spring leaf is slitted parallel to its length near the end and subjected to a deformation operation whereby an intermediate portion of the leaf is oppositely displaced with respect to the displacement of adjacent edge portions to provide opposed semi-cylindrical loops defining the eye. The deformation operation may occur either simultaneously with or subsequent to the slitting of the leaf.

3,671,031

FURNITURE SPRING CLIP AND ASSEMBLY

C. Leonard Krakauer, Roslyn Heights, N.Y., assignor to Kay Manufacturing Corp., Brooklyn, N.Y.

Filed Nov. 12, 1970, Ser. No. 88,831
Int. Cl. A44b 21/00; F16f 3/00
U.S. Cl. 267—110 5 Claims

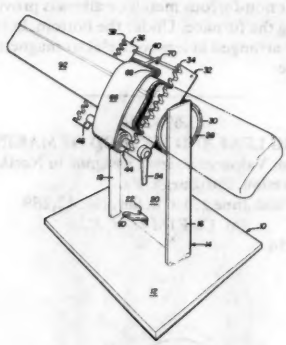
A clip of sheet material adapted for pre-assembly, or pre-assembled, to a tension spring for the seats of backs of upholstered furniture, is attached or attachable to a slotted furniture frame element merely by passing the free end part of the clip through the slot of the frame element and tensioning the spring. The clip is L-shaped at one end and has a loop at its other end adapted to embrace or embracing the wire of the spring.

3,671,032

ADJUSTABLE HOLDING DEVICE

John F. Gettinger, 1500 N.W. First Avenue, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 837,380, June 30, 1969, Pat. No. 3,595,559. This application June 22, 1970, Ser. No. 48,093
Int. Cl. B23q 1/04
U.S. Cl. 269—72 5 Claims



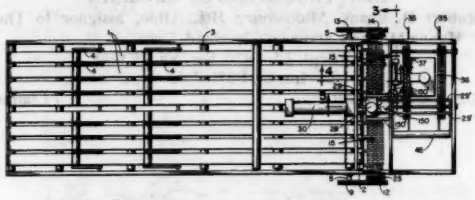
An adjustable holding device for holding automobile bumpers or the like while work is being performed on them. The device includes a support base having a vertical component defining a cradle, and a rotatable cylinder horizontally mounted on the cradle for adjustable swinging movement. At least two engaging elements for engagement with the edges of a bumper are mounted in parallel on the rotatable cylinder. Also included is a holding mechanism mounted on the engaging elements which is used for holding a bumper in position when it is engaged with the engaging elements, and a brake mechanism for holding the rotatable cylinder on the cradle in any adjusted position.

3,671,033

MACHINE AND METHOD FOR FOLDING PLASTIC BAGS AND THE LIKE

John B. Coast, Baton Rouge, La., assignor to Coast Machinery, Inc., Baton Rouge, La.

Filed Nov. 23, 1970, Ser. No. 92,087
Int. Cl. B65h 45/12
U.S. Cl. 270—83 20 Claims



An automatic, variable speed, plastic-bag-folding machine which takes flat plastic bags, rolls, folds, flattens and packages the bags; the machine consists of a conveyor belt assembly (FIGS. 1 & 2) fed by the discharge of a plastic-bag-making machine which feeds the bags into rolling, folding (FIGS. 6 & 7) and multi-bag packaging sections (FIG. 8), synchronized by a pneumatic control system (FIG. 9); the preferred embodiment produces the tubular, rolled bag by a circularly disposed set of interdigitated rollers (FIGS. 3–5); a second embodiment utilizes a continuous belt having a geometric circular rolling section therein to produce the tubular rolled bag (FIGS. 10 & 11).

Having formed the rolled bag; a vertical pin located at the middle of the tubular bag is thrust perpendicular to and against the tubular roll pulling the flexible bag from the rolling section and producing a half-fold; as the bag is pulled from the rolling section it is passed between two inwardly biased rollers to flatten the bag and then pushed into the multi-bag packaging section consisting of a tightly fitted pin slot on a set of conveyor chains which holds and secures the folded bag as the pin is retracted in preparation for the next bag folding cycle; when the appropriate number of bags have been folded and secured, a commercial packaging box is fitted beneath the loaded slots and a set of fingers are activated to push the bags out of the slots into the box.

3,671,034

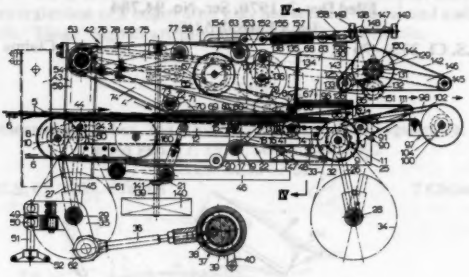
APPARATUS FOR STACKING SHEETS

Gerardus Johannes de Ridder, Baarn, Netherlands, assignor to Ingenieursbureau De Kidder N.V., Baarn, Netherlands

Filed June 30, 1970, Ser. No. 51,184
Claims priority, application Netherlands, June 30, 1969, 6909977
Int. Cl. B65 29/14; B65h 31/30
U.S. Cl. 271—68 22 Claims

An apparatus for stacking loose sheets, such as newspapers, periodicals and the like, which are fed in a continuous flow of imbricated sheets, each lying with its leading edge part under the preceding sheet of said flow, to a stack forming station having a stop forming an abutment for the leading edges of the oncoming sheets whereby each sheet is pushed underneath the preceding sheets forming a stack at the stacking station. The station is provided adjacent the stop with rotating star wheels engaging the leading edge of each oncoming sheet to lift said edge and to support the stack being formed at a small distance above the plane of feed so as to reduce the friction between the oncoming sheets and the growing stack. Further lifting means may be provided at the trailing lower edge of the stack

being formed. When a stack of the requisite number of sheets is formed, a movable separating device is inserted underneath



the stack so lifted for further raising and removing the completed stack.

3,671,035

CONVEYOR APPARATUS

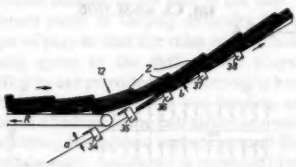
Walter Reist, Hinwil, Zurich, Switzerland, assignor to Ferag AG, Zurich, Switzerland

Continuation of Ser. No. 745,596, July 17, 1968, abandoned. This application May 6, 1970, Ser. No. 37,367

Claims priority, application Switzerland, July 21, 1967, 10389/67

Int. Cl. B65h *29/12, 29/28*

U.S. Cl. 271—76 **12 Claims**



Conveyor apparatus for transporting an imbricated formation of objects, such as a succession of folded newspapers, comprises a conveyor track adjoining the trailing edges of the newspapers, and pairs of grippers moving along the conveyor track and gripping the trailing edges of the newspapers. A distribution or device is disposed ahead of the conveyor track to provide the intervals between successive newspapers of the imbricated formation so that the distance between successive trailing edges of the newspapers corresponds to a predetermined value.

3,671,036

GOLF TEE SETTER

Joseph Rubino, Earlton, N.Y.

Filed Aug. 4, 1970, Ser. No. 60,797

Int. Cl. A63b *57/00*

U.S. Cl. 273—33 **1 Claim**

This invention relates in general to golf tees setters, and, in particular, is a device for setting golf tees so that the top of each will be the same distance as the others above the ground. The device comprises a hollow cylinder in length equal to the distance that the tee is desired to be set above the ground, and having two holes diametrically opposite each other in the sidewalls thereof, said holes being large enough to admit fingers placed on opposite sides of the cylinder almost to meet at

the central longitudinal axis of the cylinder, for holding the tee.

3,671,037

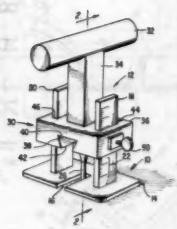
GOLF TEE SETTER-POSITIONER

John E. Murdock, Jr., Route 2, Mount Blanco, Chester, Va.

Filed Aug. 13, 1969, Ser. No. 849,680

Int. Cl. A63b *57/00*

U.S. Cl. 273—33 **16 Claims**



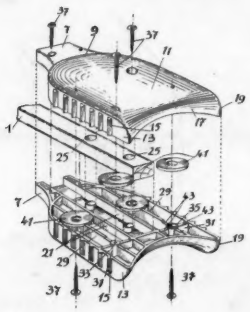
A golf tee setter and positioner has a base comprised of a foot portion and a gauge portion. A tee holder is slidably mounted with respect to the base so as to be adjustably secured to the base at selected heights above the bottom of the foot portion. In this manner, the tee head is selectively positioned at a predetermined height above the ground. The tee holder is comprised of a dovetail opening that is cut into the structure's body portion which extends upwardly to terminate at a handle for setting the tee. In one embodiment, both the body portion and the base portion are split into halves along the structure's midline. The halves are pivotally separable so as to more conveniently withdraw the structure from over a tee that has been set and positioned in long grass.

3,671,038

STICK FOR ICE BALL GAME

Maurice Liard, 276 Salaberry Street, Joliette, Quebec, Canada

Filed Dec. 29, 1969, Ser. No. 888,710
Claims priority, application Canada, Jan. 3, 1969, 39,253
Int. Cl. A63b *59/00*
U.S. Cl. 273—67 R 2 Claims



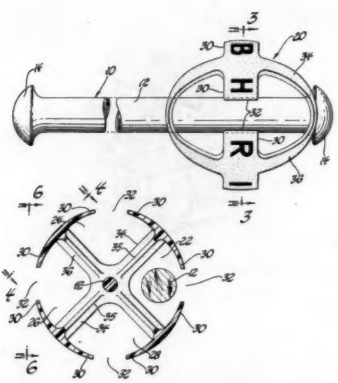
A stick for ice ball game having a straight handle and a ball-handling member at the end of the handle. The ball-handling member has the opposed ball-stricking faces formed with shovel-like cavities and straight parallel lateral edges. It has a ball-striking forward edge at the end away from the handle.

3,671,039

BAT AND SPHERE GAME PIECES

Ronald A. Niewolak, 28675 Adler Drive, Warren, Mich.

Filed Aug. 24, 1970, Ser. No. 66,506
Int. Cl. A63b *63/00*
U.S. Cl. 273—95 R 15 Claims



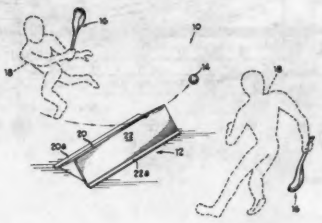
A game apparatus comprising an elongated bat having a substantially constant diameter shaft with hemispherical enlargements at either end which prevent the sphere from sliding off the end of the bat, and the sphere includes capturing members comprising at least one opening having a pair of flexible tabs marked with different indicia extending toward one another from opposite sides of the opening thereby defining an entrance to the opening. When the bat strikes the sphere in substantial alignment with the entrance to the opening, the tabs allow the bat to snap therebetween and be retained in the opening.

3,671,040

SURFACE REBOUNDING APPARATUS INCLUDING BALL, RACKET, AND REBOUND SURFACE

Burton C. Meyer, Chicago, and Robert S. McKay, Morton Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 3, 1970, Ser. No. 94,784
Int. Cl. A63b *63/00*
U.S. Cl. 273—96 R 5 Claims



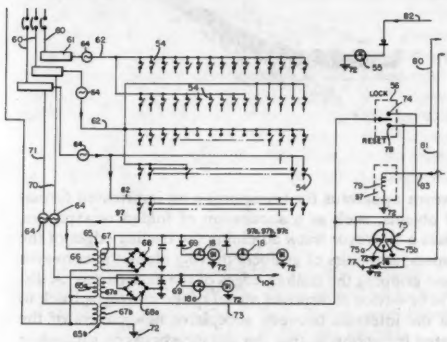
A competitive action game of the type wherein a reboundable ball is launched toward, and returned by, opposing participants with the aid of a racquet-like instrument, characterized by the provision of an intermediate rebounding surface which the ball must strike in its path of flight towards an opposing player, the rebounding surface including opposed inwardly and upwardly directed portions.

3,671,041

ELECTRICALLY OPERATED BINGO GAME APPARATUS

Floyd R. Taylor, 3346½ Walnut Avenue, and Robert B. Whitaker, 5049 Bowman Oaks Way, both of Carmichael, Calif.

Continuation-in-part of Ser. No. 654,736, July 20, 1967, abandoned. This application Jan. 30, 1970, Ser. No. 7,203
Int. Cl. A63f *3/06*
U.S. Cl. 273—135 A 13 Claims



An electrical "Bingo" game comprising a player console having a plurality of groups of playing boards, each board including a series of numbers on a translucent panel, at least some of said numbers appearing on more than one panel, a light containing compartment behind each number, all of said lights in a single group being mounted in current conducting relation to a common metallic base plate, a master control board having a switch corresponding to each number, a source of electrical energy and an electrical interconnection between each switch on the one master control board and the lights serving to illuminate the corresponding number on each of the individual playing boards, said lights in each group being con-

nected to ground through said metallic base plate and each having a diode which prevents the flow of current from the direction of ground, whereby a possible feedback causing a false lighting of one or more numbers is prevented. Coin actuated switches are provided for energizing selected groups of boards, as are coin return means and lock means precluding energization of a board after play has started. Visual and audible "Bingo" signals are provided for the player console.

3,671,042

GOLF COURSE

Alexander Garber, 261 Church Street, Apt. 34, Kingston, Pa.

Filed Feb. 17, 1971, Ser. No. 116,002

Int. Cl. A63b *67/02*

U.S. Cl. 273—176 AB **7 Claims**

A golf course layout having a plurality of holes in which each hole includes a T-area, at least one landing zone having a limited landing area, and a green having a cup therein. The landing area may be a depression, inclined toward the tee, delineated by surface markings and made either of a turf-like putting grass material or a material such as sand to impede the ball. The game is played so that the player must land the ball in the limited landing area prior to advancing the ball toward the green for eventual sinking of the ball in the cup. The layout provides different paths of varying difficulty for each of the different stages of play so that the rules may be tailored to accommodate the game to the skill of the player. Varying degrees of difficulty are provided by interposing hazards in the direct path between the tees and the landing areas which require the player to advance the ball airborne over the hazard or putt the ball along the ground surface around the hazard in a curved circuitous path. Assistance is provided in maintaining the ball in the curved path by banking the ground surface in a manner to assist the circuitous travel of the ball.

3,671,043

DEVICE FOR POSITIONING A MAGNETIC HEAD TO A SELECTED TRACK OF A MULTI-TRACK RECORDING TAPE

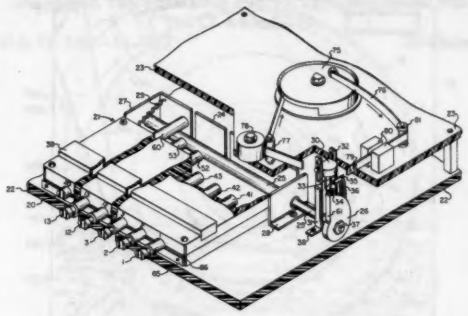
Joseph James Zimmermann, Elm Grove, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 4, 1970, Ser. No. 43,462

Int. Cl. G11b *5/56*

U.S. Cl. 274—4 A **6 Claims**

A device for positioning a magnetic head to a selected track of a multi-track recording tape, wherein a rotatable follower plate is controlled by a plurality of mechanically interlocking push buttons, each having an individual different length actuator bar, with the amount of angular rotation of the follower plate being predetermined in accordance with the length of each actuator bar. The interlocking arrangement of the push buttons is so arranged that each last-operated push button unlocks the previously operated push button and thereafter locks itself operated. In the device, a cam is attached to the end of the shaft of the follower plate, with the cam surface engaged by a follower arm attached to the magnetic head, whereby operation of any push button simultaneously causes a specific deflection of the follower plate and a correspondingly specific rotation of the cam to enable the follower arm to raise or



lower the magnetic head to the track on the tape corresponding to the operated push button.

3,671,044

MAGNETIC RECORDING AND PLAYBACK INSTRUMENT AND SUPPORT FOR MAGNETIC RECORDING

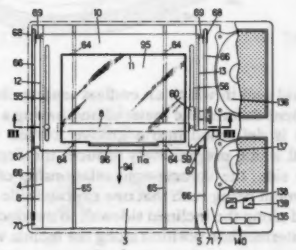
Milos Blazevic, 62, rue Georges Ferrand, Bonneuil-sur-Marne, and Joseph Kohn, 146 Boulevard de Grenelle, Paris, both of France

Filed July 7, 1969, Ser. No. 839,471

Claims priority, application France, July 4, 1968, 68157948

Int. Cl. G11b *25/04*

U.S. Cl. 274—4 J **6 Claims**



Apparatus designed for playback of magnetic tracks from one side of a rectangular simultaneously with visual reading of a printed text corresponding to the recorded program on the opposite side. A movable marker, always moving from left to right across the lines of the text, provides a continuous indication correlating the audio replay with the text, the distance being transversed by the magnetic head from either side of the card being equal to the distance traversed by the marker from the left side of the card.

3,671,045

RECORD CHANGER

Edward S. Bara, Elmwood Park, Ill., assignor to Warwick Electronics Inc.

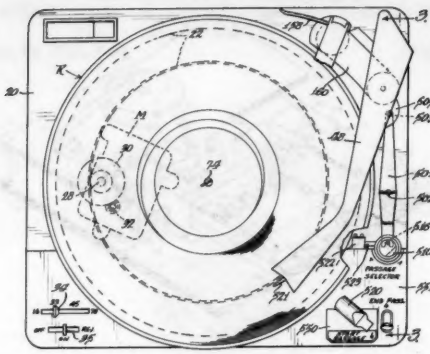
Filed Jan. 19, 1970, Ser. No. 3,887

Int. Cl. G11b *15/00*, *17/06*

U.S. Cl. 274—10 R **9 Claims**

A record changer having a manually operable mechanism for cuing a tone arm to place the tone arm at a desired set-

down position on a record. Also, a record changer having settable structure for automatic repeat playing of a chosen



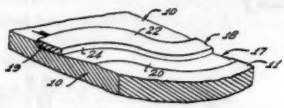
band or passage selected at random between the beginning and end of the grooves of the record.

3,671,046

RING SEAL WITH SPECIAL GROOVE CONFIGURATION

Foster M. Hagmann, 130 N. Bristol Avenue, Los Angeles, Calif.

Filed March 3, 1970, Ser. No. 16,008
Int. Cl. F16j *15/06*
U.S. Cl. 277—170 **22 Claims**



A fluid seal in which an endless sealing element composed of resilient deformable material and having a polygonal cross-section is deformed into a groove formed with an inclined sidewall which progressively reduces the depth of the groove on one side, the volume-void relationship of the groove and the element being such that one exposed side of the element is wedged along the inclined sidewall to a reduced thickness and to an intermediate position along the incline when the element and groove are of nominal dimension conditions, and is wedged a greater or lesser distance along the incline with other variations within permissible tolerances. Alternative embodiments include a closure with a sealing element on one side; a retainer with sealing elements in back-to-back relation; and a second retainer with sealing elements on the remote sides of two separable retaining rings and with a double element between the rings, the retaining rings being specially joined and formed to accommodate separation of the sealed surfaces while maintaining an effective seal.

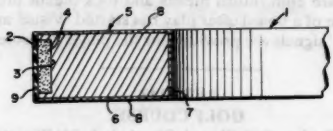
3,671,047

PISTON RING AND PROCESS OF MAKING THE SAME

Kouji Umezawa, Konosu, Japan, assignor to Nippon Piston Ring Kabushiki Kaisha, Toyko, Japan

Filed Nov. 10, 1970, Ser. No. 88,320
Claims priority, application Japan, Nov. 18, 1969, 44/92388
Int. Cl. F16j *9/12*
U.S. Cl. 277—235 R **4 Claims**

A cast iron piston ring is provided with a friction reducing packing of bonded iron oxide nd carbon powder in a groove of its outer circumferential face, and with a hard chromium electrodeposit on all other surfaces by first applying a packing composition including a heat curing bonding agent, thereafter coating the packing with an aqueous polytetrafluoroethylene dispersion, drying and sintering the resin into a continuous



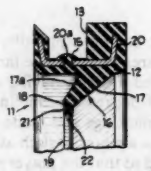
film while simultaneously curing the packing, and thereafter electrodepositing chromium, the cured packing being protected against attack by the chromium plating bath by the resin film.

3,671,048

LIP TYPE SEAL

Emeric J. Gyory, Park Ridge, and Otmar E. Teichmann, Lincolnwood, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 12, 1970, Ser. No. 45,748
Int. Cl. F16j *15/32*
U.S. Cl. 277—227 **5 Claims**



A lip type seal adapted to provide a seal between a housing and a relatively rotatable shaft including a sealing lip in sealing engagement with the shaft. The lip includes a non-woven mat of randomly disposed interconnected fibers of a synthetic polymer such as polytetrafluoroethylene, polyester, polyamide or the like impregnated with a synthetic elastomer such as oleophobic silicone rubber. Fibers forming the mat are partially exposed at the lip for contact with the shaft.

3,671,049

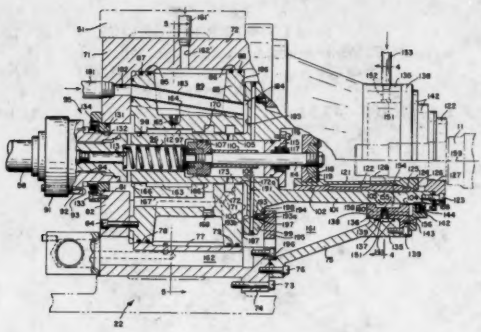
FRICTION WELDING APPARATUS

Alex F. Stamm, Rochester, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Division of Ser. No. 650,505, June 30, 1967, Pat. No. 3,575,334. This application Oct. 1, 1970, Ser. No. 77,208
Int. Cl. B23b *31/30;* **F16c** *7/04;* **B23k** *27/00*
U.S. Cl. 279—4 **10 Claims**

A friction welding apparatus is particularly adapted for the friction welding of relatively heavy workpieces, as for example the center section and wheel bearing end spindles of a drive axle housing, and comprises special hydrostatic bearing equipped devices for mounting the rotating workpieces. Each such device is mounted for axial displacement and comprises a rotatable arbor assembly to which the rotatable workpiece, such as a wheel bearing end spindle, is clutched and the arbor assembly is rotatably supported in a housing by two axially spaced hydrostatic journal bearings. Front and rear hydrostatic thrust bearings are provided between the arbor assembly and the housing. Oil under suitable pressure is supplied to both the journal and thrust hydrostatic bearings, and controls are provided for attaining and maintaining suitable fluid pressure levels at these bearings. One aspect of control insures that the workpiece is not secured to the arbor assembly until jour-

nal bearing oil pressure reaches a certain level. Oil is forced under high pressure into the bearings through specially ar-

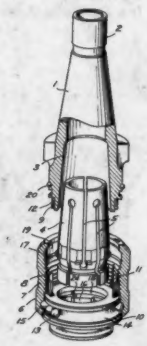


ranged passages and after being discharged from the hydrostatic bearings returns to a sump at lowered pressure.

3,671,050
CHUCKS

Ake Paul Andersson, and Per Augustin Wegmar, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed March 11, 1970, Ser. No. 18,658
Claims priority, application Sweden, March 24, 1969, 4100/69
Int. Cl. B23b *31/04*
U.S. Cl. 279—47 **2 Claims**

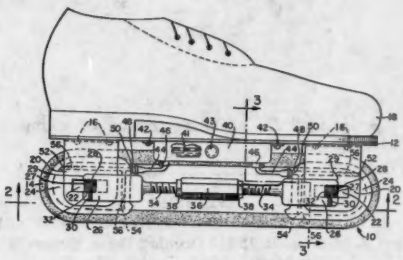


A chuck for holding a tool comprises a chuck support having a conical recess which accepts a conical clamping sleeve. A clamping nut carrying a freely rotatable ring is threaded onto the chuck support. The ring has means for engaging the chuck support in such a way to permit relative axial movement therebetween but no relative rotational movement. Shoulders on the clamping sleeve and the ring are so arranged that in one relative position axial movement therebetween is blocked while in another relative position the clamping sleeve can pass through the ring.

3,671,051
VEHICLE

August R. Werft, 233 Dixon Boulevard, Uniontown, Pa.

Continuation-in-part of Ser. No. 871,823, Oct. 28, 1969, abandoned. This application Aug. 11, 1970, Ser. No. 62,985
Int. Cl. A63c *17/10*
U.S. Cl. 280—11.1 ET **28 Claims**



An endless belt vehicle which, for example, might take the form of a sled, scooter, wagon or skate. The endless belt passes over nonrotating belt housings having belt retaining grooves in the periphery thereof with a coating of a material which when lubricated provides a substantially frictionless surface, while not being adversely affected by the lubricant. Means can also be provided to adjust the belt tension and thus to control the speed.

3,671,052
SKI BINDINGS

Donald F. Wilkes, Albuquerque, N. Mex., assignor to Rolamite Incorporated, San Francisco, Calif.

Continuation-in-part of Ser. No. 717,114, March 29, 1968, Pat. No. 3,543,595. This application Jan. 16, 1970, Ser. No. 3,463
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **34 Claims**

Ski bindings for gripping the heel and toe portion of a ski boot. The heel and toe bindings are separate units which release by a snap action in response to the application of a predetermined force through the heel or toe of the boot to the respective bindings. A snap action blade provides the force for resisting lifting movement of the heel of the boot and for resisting swinging movement of the toe of the boot relative to the ski. Both the release force and the degree of movement permitted by the respective bindings is adjustable.

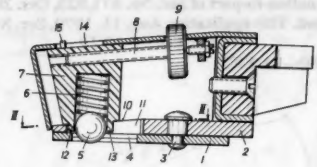
3,671,053
SKI BINDING

Thomas G. Smolka, Wien-Mauer, Austria, assignor to Wiener Metallwarenfabrik Smolka & Company, Wien-Mauer, Austria

Filed July 18, 1969, Ser. No. 842,957
Claims priority, application Austria, July 29, 1968, A 7363/68
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **12 Claims**

Releasable ski binding for precise adjustment of release tension. Binding has a pivotal member and varies radial distance

of locking component from pivot point of pivotal member for adjusting release pressure. Further control features if desired

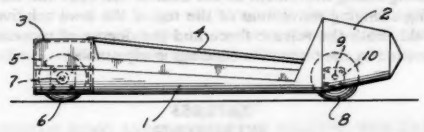


may be provided for adjusting tension of spring bearing against locking member.

3,671,054
RELEASABLE BINDING MECHANISM FOR SKIS
Robert A. Mittelstadt, 15117 Orchard Drive, Burnsville, Minn.
Filed Oct. 6, 1969, Ser. No. 870,476
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 M **13 Claims**

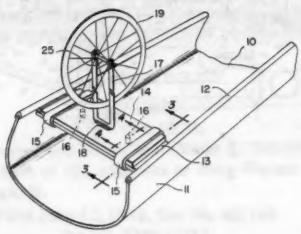
A releasable binding mechanism for a ski including a boot support member resiliently mounted on the ski and a releasable cable means for securely holding the boot on the support member. A plurality of micro-switches mounted within the boot support member and adapted for actuation upon relative movement between the boot support member and the ski. An explosive charge and an electric igniter therefor adapted for energization when one or more of said micro-switches is closed. The gas pressure released upon ignition of the explosive charge actuates a cable release mechanism to thereby release the skier's boot from the ski.

3,671,055
COASTER VEHICLE
Carl P. Aarup, Springfield, Ill., assignor to Dura Corporation, Springfield, Ill.
Filed Jan. 29, 1971, Ser. No. 110,971
Int. Cl. B62k 9/00
U.S. Cl. 280—87.01 **6 Claims**



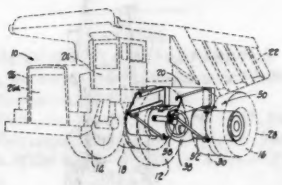
The invention herein disclosed relates to a coaster vehicle comprising a body having a rider compartment with handrails running along the top lateral edges of said compartment. The body of the vehicle is continuously curved upwardly and outwardly in transverse cross-section and decreases in width from the rear to the front. Mounted on transverse axes adjacent to the front and rear end of the body and projecting outwardly through openings in the bottom thereof are spherical rollers, the centers of which lie in the longitudinal vertical plane of the vehicle. By reason of these spherical rollers the vehicle will operate on a surface having a high coefficient of friction. Steering is effected by the rider leaning to one side or the other to effect drag of the bottom portion of the vehicle.

3,671,056
BOAT TRANSPORT DEVICE
Kenneth C. Windemuth, Mount Savage, Md.
Filed Aug. 18, 1970, Ser. No. 64,701
Int. Cl. B62b 1/18
U.S. Cl. 280—47.32 **2 Claims**



Many times boats have to be transported over land in order to reach a body of water. Such boats can be readily transported by attaching a single wheeled device, preferably to the center seat board of the boat, inverting the boat, and by use of handles on the stern board of the boat guiding and propelling the boat to the body of water. The single wheeled device is firmly attached to the boat in a way that there will be no play between the transport device and boat as the boat is being transported. Further, the single wheeled device may also carry a seat board reinforcing member.

3,671,057
VEHICLE SUSPENSION
Ronald M. Cheers, Mentor, Ohio, assignor to Euclid, Inc., Cleveland, Ohio
Filed July 6, 1970, Ser. No. 52,243
Int. Cl. B60g 9/00
U.S. Cl. 280—124 R **13 Claims**



A vehicle suspension is disclosed in which the vehicle frame is suspended on driven vehicle wheel assemblies. The new suspension includes a radius arm connected between an axle housing and the vehicle frame. A suspension spring unit is also connected between the axle housing and the frame.

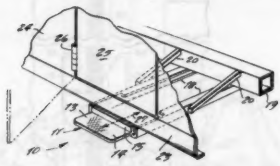
The suspension spring unit includes a piston member connected to the axle housing and a housing defined by the frame for receiving the piston. The piston member is resiliently supported against vertically upward movement relative to the frame as well as against lateral and longitudinal movement relative to the frame.

3,671,058

ROLL OUT STEP FOR PICK UP TRUCKS

Miles L. Kent, 1330 Hawley Highway, Belding, Mich.

Filed June 25, 1970, Ser. No. 49,834
Int. Cl. B60r *3/02*
U.S. Cl. 280—166 1 Claim



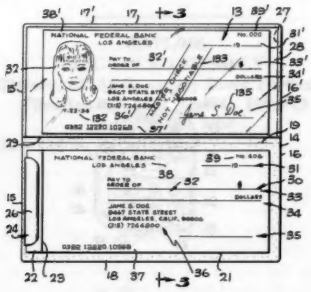
A retractable step for a pick-up truck, the step being normally stored below the rocker panel where it extends under the pick-up truck door, the step being connected by a mechanism to the door step slides inwardly or outwardly according to the opening and closing of the door.

3,671,059

CHECK BOOK HOLDER HAVING MASTER CHECK

Helen D. Zeller, 424 South Los Robles, Pasadena, Calif.

Continuation of Ser. No. 826,580, May 21, 1969, abandoned.
This application Dec. 14, 1970, Ser. No. 98,071
Int. Cl. B42d *15/00*
U.S. Cl. 283—7 3 Claims



A check book holder detachably carrying a book of personalized blank checks each having printed thereon the name and address of the person or persons authorized to negotiate the checks, and with the holder also carrying a master check printed in a manner similar to the check blanks, with the name and address of the same person or persons as on the blank checks for comparison therewith, and with a picture of the authorized person or persons also printed on the master check for assistance in identification at the time of negotiation of a check.

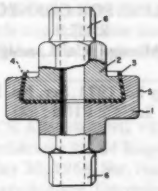
3,671,060

INSULATING FITTING AND METHOD FOR MANUFACTURING

Hans Kyburz, Bruggweg 40, Dornach, Switzerland

Filed Feb. 27, 1970, Ser. No. 14,972
Int. Cl. F16l *11/12*
U.S. Cl. 285—54 5 Claims

An article of manufacture and a method of manufacturing electrically insulated metal pipe couplings both of the fixed or separable union type. The couplings may be insulated at one or both ends. The couplings includes an external body member component and a separate internal sleeve or thimble-like component which has an insulation layer interposed between radial and axial wall portions of said external and internal members, which insulation layer may be of generally preformed cup-like shape or by use of suitable jigs, to hold the respective body members it may be injected in a fluid state therebetween. The radial peripheries of the corresponding body parts are complementally tapered so as to preclude disassembly of the unitary finished coupling. When using preshaped complementary components of generally circular form, rather than various polygonal shapes, the complementally shaped surfaces of the metal components which abut against the sandwiched-in insulating layer are pretreated mechanically by special knurling or surface grooving, and possibly also chemically treated with a special solvent, thereby assuring an aggressively tight and leak proof seal when assembled which will resist torsional separation. The method of assembly for one form which includes an external socket member having an outer deformable peripheral wall is to have it in initially sufficiently open condition and placing it upon the reversely tapered internal member in nesting relationship with the insulation piece and internal socket component, and while applying an axial assembly force, simultaneously applying a radial compressing force to the deformable peripheral wall to form it tightly around the internal tappered portion to form a sealed insulated coupling. The insulation preferably projects axially beyond the joined components and also is radially spaced from the main portion of the socket component. Another form of assembly utilizes an internally inserted tool to apply a radially outwardly directed expansion force to sealingly seat the internal coupling member and insulating member tightly into unitary assembly with the external jacket or main coupling body. In still other forms the internal component may be formed with progressively thickened or inwardly tapered end spigot portions which are adapted to be forced radially outwardly by an internal expansion tool against an interposed insulation layer strategically placed therebetween, while applying an axial assembly force to assure a completely tight sealed assembly of both the radial and axial wall portions of the insulating member between the corresponding portions of the external and internal metallic coupling components. The coupling embodying an external jacket or sleeve preferably will have two such internal components assembled therewith in opposite ends. The method of assembly is carried out preferably in two steps including applying a slight initial expansion to the internal member of the assembled components in a slightly warmed up condition of about 80°, and the subsequent step is completing the expansion at approximately the normal room temperature.



3,671,061

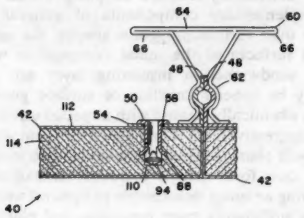
GYPSUM BOARD FASTENER

Jack A. Dawdy, Kenmore, N.Y., assignor to National Gypsum Company, Buffalo, N.Y.

Filed July 2, 1970, Ser. No. 51,760
Int. Cl. F16b *5/00*
U.S. Cl. 287—20.92 W 2 Claims

Gypsum wallboard having an unbroken front face and means for affixing the wallboard to a support consisting

preferably of a blind fastener extending into the body of the board through the back face, grasping the board by enlarged



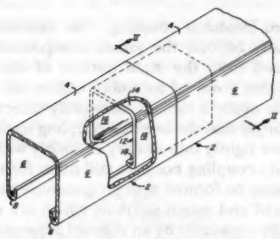
portions of the fastener disposed within the body of the board.

3,671,062

INTERNAL COUPLING FOR CONNECTING U-SHAPED RAILS

James E. Ashworth, Moraga, Calif., assignor to United States Steel Corporation

Filed May 13, 1971, Ser. No. 142,872
Int. Cl. F16d 1/00
U.S. Cl. 287—127 3 Claims



A U-shaped coupling is received snugly within two U-shaped rails which are to be connected. Each rail has an inwardly directed lip at the end of each leg extending toward its base. The coupling has an inwardly extending flange at the end of each leg forming an angle of less than 90° with its associated leg, the flange bearing against the free end of the associated lip. Engagement of the flanges with the lips force the coupling into tight engagement with the rails.

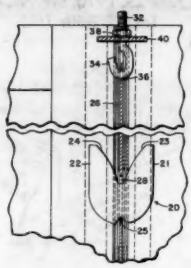
3,671,063

CONNECTOR

James D. Slayden, Nashville, Tenn., assignor to Avco Corporation, Nashville, Tenn.

Filed Oct. 5, 1970, Ser. No. 77,955
Int. Cl. F16b 5/06
U.S. Cl. 287—189.36 C 4 Claims

The frames of two adjacent panels are interconnected and locked together by means of a V-shaped anchor plate. The anchor plate is mounted within a slot in a bar located between the adjacent frames, both ends of the V in the anchor plate ex-



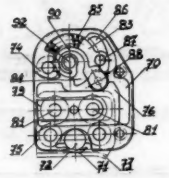
tending through corresponding slots in the adjacent frames. Force applied to the bar positively wedges the anchor plate simultaneously with both frames, thereby locking the structure together.

3,671,064

BALL OR ROLLER FASTENING DEVICE

Paul Boyriven, Paris, France, assignor to Compagnie Industrielle de Mechanismes, Courbeuole, France

Filed Oct. 23, 1970, Ser. No. 83,372
Claims priority, application France, Nov. 28, 1969, 6941078
Int. Cl. E05c 3/16
U.S. Cl. 292—45 3 Claims



A fastening device for latching a door, an engine bonnet or a trunk of a vehicle including a striking plate having a rocking recess along its periphery defining a striking nose at the forward end and a casing formed with chamber for the reception of the striking plate and formed with a housing opening into the recess in fastening position of the device. A locking member is provided in the housing to normally protrude from the housing into the chamber to be received in the locking recess, and a rocking section is also provided in the housing, this sector resiliently biassing the locking member out of the housing into the chamber. A hooking nose is formed on the rocking sector forwardly of the locking member with respect to the inserting movement of the striking plate in the chamber and the hooking nose is spaced a distance from the locking member such as to hold therein the striking nose in inserting movement of the striking plate whereby to achieve a first or safety latching of the door, bonnet or trunk.

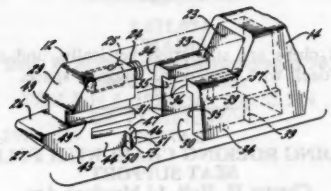
The sector is mounted in the housing for resilient rocking about a pivot and biasing of the locking member into the chamber. The locking member is a roller and a resilient spiral connection is provided on which the roller is mounted and which limits the frictional engagement of the roller to differential rolling movement between the rocking sector and the striking nose.

3,671,065

SLIDABLE BOLT CATCH

Bruce N. Bingham, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Dec. 11, 1970, Ser. No. 97,074
Int. Cl. E05c *1/10*
U.S. Cl. 292—175 7 Claims



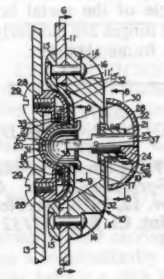
A catch for mounting on a swingable door including a support with a slidable bolt mounted within a chamber for movement between projected and retracted positions and urged toward the projected position by a spring. Two prongs formed integrally with and resiliently hinged to the bolt snap into a pair of elongated recesses in the chamber walls to prevent the bolt from sliding past its projected position. Flanges extending from the walls and into the chamber fit in corresponding grooves formed integrally in the bolt to guide the latter as it moves between its projected and retracted positions.

3,671,066

BAG LOCK ASSEMBLY

John W. Gilmore, 2222 S.E. Ankley Street, Portland, Oreg.

Filed Jan. 25, 1971, Ser. No. 109,449
Int. Cl. E05c *3/04*
U.S. Cl. 292—228 1 Claim



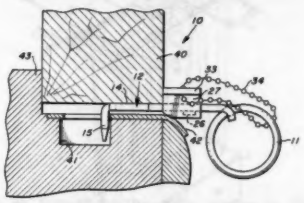
A lock designed for a bag having a flap extending over part of the top and part of the outside face of one wall of the bag, the lock consisting of a portion on the bag wall and a cooperating companion portion on the flap, the portion on the flap of the bag being so positioned as to overlie and mate with the portion on the bag wall, the two portions so constructed that the portion on the bag wall will be locked within the portion on the flap when the flap is pressed against the bag wall. When the two portions are locked in this manner they can be unlocked only by giving a 90° turn to a locking knob on the outer portion.

3,671,067

MULTI-PURPOSE KEY RING TOOL AND DOOR LOCK

Albert Wegner, 223 Sylmer Court 9, Calimesa, Calif., and Wilfred Tunstall, 12874 2nd Street, Yucaipa, Calif.

Filed Oct. 21, 1969, Ser. No. 868,105
Int. Cl. E05c *19/18*
U.S. Cl. 292—292 3 Claims



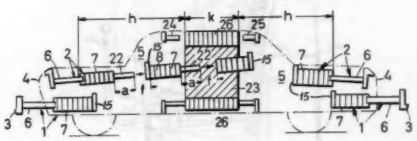
A flat metal stamping about an inch and one-half long and 1 inch deep terminating at one end in an apertured laterally bent nose for receiving a key ring and at the other end in a laterally bent offset screw driver which cooperates with a pin extending from said stamping, and a deeply slotted wedge block backed up by said pin to lock any door from the inside. Embodied with upper and lower edges of the stamping are a bottle opener, a safety bottle cap applicator and remover, which may also be used as a golf shoe cleat replacing wrench.

3,671,068

SHOCK ABSORBING VEHICLE

Otto Gerhard, Wohrdstrasse 95, 84 Regensburg, Germany

Filed May 20, 1968, Ser. No. 730,496
Claims priority, application Germany, May 22, 1967, G 50150
Int. Cl. B60r *19/00*; B61g *11/16*; F16d *63/00*
U.S. Cl. 293—1 4 Claims



A car or motor vehicle having an undivided chassis with deformation zones therein and having means which can be deformed and destroyed. A plurality of at least two-part kinetic energy dissipating devices, in which the parts are displaceable one against another, are attached with their ends to respective ends of the deformation zones for bridging the latter. The energy dissipating devices consist mainly of push rods coaxially arranged with corresponding housings containing breaker plates which are pierced by the rods.

3,671,069

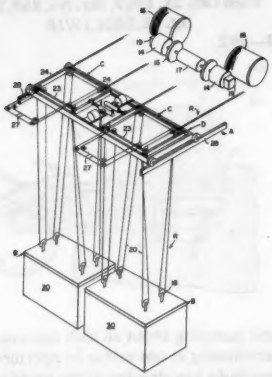
CARGO CONTAINER LIFTING AND SPACING APPARATUS

John Frank Martin, and Charles Dean Ramsden, Alameda, both of Calif., assignors to Fruehaul Corporation, Detroit, Mich.

Filed July 15, 1970, Ser. No. 54,960
Int. Cl. B66c *1/00*
U.S. Cl. 294—81 SF 3 Claims

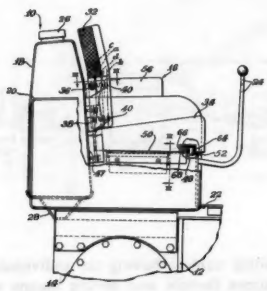
Cargo container loading apparatus in which the containers are carried on a pair of spreaders, each suspended from a

separate platform mounted on a trolley. The spacing between the containers is adjustable, independently of the spreaders,



by means of motor operated screws which move the platforms toward or away from each other on the trolley.

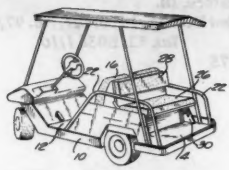
3,671,070
COMBINATION FUEL TANK AND OPERATOR'S SEAT FOR TRACTORS
Robert W. Johnson, Winfield, and Harvey B. Karpiel, Roselle, Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Aug. 17, 1970, Ser. No. 64,481
Int. Cl. B60n *1/06*
U.S. Cl. 296—65 R **2 Claims**



A combination body-tank-seat assembly for tractors wherein the tractor operator is seated forwardly of the tractor fuel tank, and wherein the operator, his seat, and the fuel tank are all located between box-like body structures provided at the sides of, and in assembly with, the overall combination.

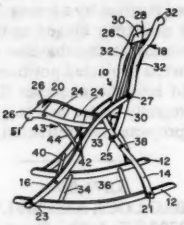
3,671,071
CONVERTIBLE GOLF CAR
Ralph S. Evinrude, Jensen Beach, Fla., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed May 16, 1969, Ser. No. 825,207
Int. Cl. B60n *1/10*
U.S. Cl. 296—69 **10 Claims**

A four-wheeled vehicle has a rear seat and a rear seat back independently adjustable to convert for alternative provision of a passenger carrying seat, a well in which golf



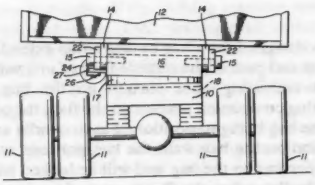
bags and clubs are supported vertically, and a luggage carrying deck with horizontal baggage space.

3,671,072
FOLDING ROCKING CHAIR WITH FOLDING SEAT SUPPORT
Chester H. Holt, 14 Murdock Ave., Winchendon, Mass. 01475
Filed July 31, 1969, Ser. No. 846,467
Int. Cl. A47c *3/029*
U.S. Cl. 297—32 **1 Claim**



A folding rocking chain of wood has the front legs partially supported by bearing against an extension of the rear legs and has a pair of foldable, angled, metal braces pivotally supported on a front leg rung with the forward ends of the braces pivotally received and hidden, in slots in the seat frame elements. A round, beaded seat edge thus appears to be cantilevered and free of ungainly bracing while actually firmly supported. The seat edge is received in the angle of the metal braces when folded. L shaped metal seat hinges are similarly received and hidden in slots in back frame elements.

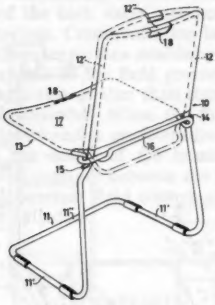
3,671,073
TILTABLE MOUNTING FOR DUMP TRUCK BODIES
Michael Bilas, 2730 Columbiana-New Castle Road, New Springfield, Ohio 44443
Filed Nov. 12, 1970, Ser. No. 88,629
Int. Cl. B65g *67/32*
U.S. Cl. 298—17 S **5 Claims**



A tiltable mounting for dump truck bodies positions a rotatable wedge shaped member on the dump truck frame

in oppositely disposed matching relation to a fixed wedge shaped member positioned thereon and carrying the dump truck body in pivotal relation thereto. Means for imparting rotation to the rotatable wedge shaped member on the dump truck frame alters the relative positioning of the wedge shaped members and enables the dump truck body to be maintained on a transversely level plane despite transverse tilting of the truck frame axles and wheels as occurs when one of the wheel assemblies sinks into a soft supporting surface.

3,671,074
CHAIRS
Berit P. Bergstrom, Mellansjovagen 50, Huddinge, Sweden
Filed July 6, 1970, Ser. No. 52,314
Int. Cl. A47c *3/04*
U.S. Cl. 297—239 **4 Claims**



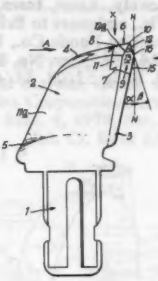
A chair having a frame, a seat and a seat carrying member mounted upon the frame and provided with at least one loop. The seat has a rear end fitting into the loop so that the seat carrying member is subjected to two opposed forces when the seat is subjected to a vertical load.

ERRATUM

For Class 298—17 see:
Patent No. 3,671,073

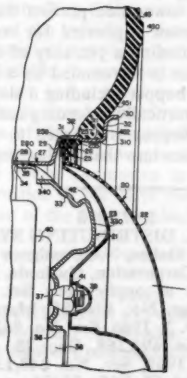
3,671,075
CUTTER PICKS
Brian Eyre, Sheffield, and John Bland, Epping, England, assignors to Padley & Venables Limited and Sir Robert McAlpine & Sons Limited
Filed Dec. 7, 1970, Ser. No. 95,863
Claims priority, application Great Britain, Dec. 30, 1969, 63,184/69
Int. Cl. E21c *35/18*
U.S. Cl. 299—79 **11 Claims**

A cutter pick having a head carrying an insert of hard material and having a longitudinally extending shank by which it is removably held in a pick box for transversing movement in a longitudinally extending cutting plane of the pick; the insert has a convex top face and a face which is intended to lead during traversing movement of the pick which leading face comprises a convex front face part and an intermediate face part, the latter being formed by relieving the corner portion of the insert where the front face part and top face would normally intersect; the insert has a top edge constituted by the line of junction between the leading face and the top face; the intermediate face part is set by a side which coincides with the top edge and by a front edge part constituted by at least one line of junction between the intermediate face part and the front face part; and the front face part has a positive rake angle in the cutting plane and the intermediate face part has a rake angle in the cutting



plane which is less than the rake angle in the cutting plane of the front face part.

3,671,076
VEHICLE WHEEL TRIM
Charles B. Aske, Jr., 1278 Pilgrim, Birmingham, Mich. 48009
Filed May 21, 1970, Ser. No. 39,260
Int. Cl. B60b *7/04*
U.S. Cl. 301—37 R **2 Claims**

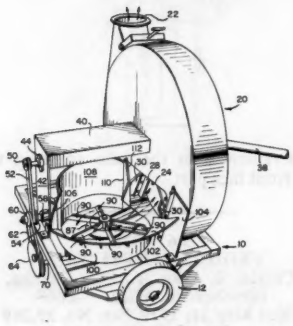


Vehicle wheel trim for modern vehicle wheels in the form of a wheel trim assembly telescopically mounted within the tire bead seat annulus of vehicle wheels preferably comprising a clear, tinted, or colored transparent plastic outer bubble and an opaque ornamental plastic inner plastic disc preferably chrome plated, chrome plated and painted, or painted in whole or in part to produce a variety of highly desirable aesthetic effects. The outer plastic bubble and inner plastic ornamental disc are of the same diameter and terminate in mating peripheral flanges over which is telescopically disposed an improved, simplified and positive resilient anchorage means which substantially seals the peripheries of the wheel trim elements together and removably secures the ornamental wheel trim assembly on the vehicle wheel within the tire bead seat annulus thereof, the said anchorage means providing for relative thermal expansion and contraction differentials of the metal vehicle wheel rim and the plastic wheel trim elements. The anchorage means alternately may include a metal brightly finished spring expansion ring which is not only ornamental but also serves as an auxiliary anchorage element. Also, alternatively, a single ornamental wheel cover element may be substituted for the outer bubble and inner disc elements.

3,671,077
FORAGE BLOWER

Charles T. Hoyt, John W. Haun, and Dwight L. Hensel, Brillion, Wis., Clarence M. Hansen, East Lansing, Mich., Walter G. Lovely, Ames, Iowa, and Hjalmar D. Bruhn, Madison, Wis., assignors to Brillion Iron Works, Inc., Division of Beatrice Foods Co., Brillion, Wis.

Filed Sept. 24, 1969, Ser. No. 860,496
Int. Cl. B65g *53/08, 53/46*
U.S. Cl. 302—8 4 Claims

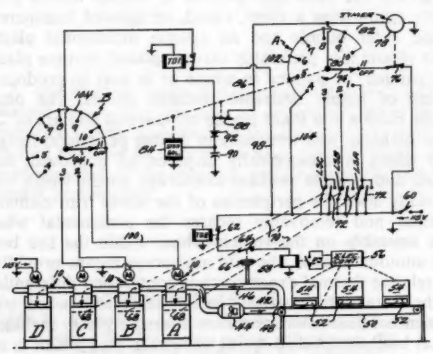


A fan is supported for rotation about a horizontal axis within a fan housing having an outlet at the top thereof and an inlet at the lower side portion thereof. A feeder means includes a rotor supported for rotation about a vertical axis and including a plurality of radially extending blades. This rotor is surrounded by a hopper open at the top thereof, the hopper including a sloping front wall and a substantially vertically extending rear wall. An outlet portion of the hopper is adapted to direct material from the feeder means into the fan housing.

3,671,078
MATERIAL DISTRIBUTING SYSTEM

Cecil S. Wise, Dallas, N.C., assignor to Fiber Controls Corporation, Gastonia, N.C.

Continuation-in-part of applications Ser. No. 217,154, Aug. 15, 1962, Ser. No. 444,885, Mar. 2, 1965, Ser. No. 538,437, Mar. 3, 1966, Ser. No. 561,579, June 29, 1966, and Ser. No. 694,268, Dec. 28, 1967. This application July 9, 1969, Ser. No. 848,133
Int. Cl. B65g *53/04*
U.S. Cl. 302—28 45 Claims

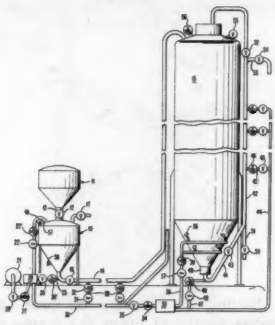


A system for distributing fibers pneumatically from a source to any of a plurality of distributors and electrical control circuitry for determining which distributors receive fibers in which order. Several electrical control circuits for sequentially checking each of the distributors in a system to determine which of them is demanding fibers and to sequentially satisfy the demands for fibers by opening valves associated with the distributors so that the air stream containing the fibers is drawn into a distributor, wherein the air stream and the fibers are separated, are disclosed. Also disclosed are a number of different distributors suitable for removing fibers from air streams.

3,671,079
METHOD AND APPARATUS FOR HANDLING MATERIAL

Walter D. Huffaker, Kodak, Tenn., assignor to Ma-Tran Corporation, Knoxville, Tenn.

Filed Apr. 16, 1970, Ser. No. 29,005
Int. Cl. B65g *53/16, 53/36*
U.S. Cl. 302—29 8 Claims

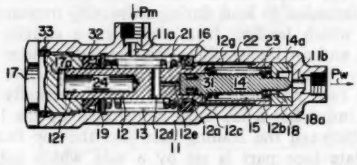


A fluidizer receives material from a source. After the fluidizer is filled with material, the material therein is aerated. Then, the material is conveyed to a storage tank by pressurized air. The material in the lower portion of the storage tank is aerated whenever material is to be delivered from the storage tank.

3,671,080
DEVICE FOR REGULATING THE PRESSURE BETWEEN FRONT AND REAR BRAKE CYLINDERS

Hiroshi Kawaguchi, Toyota-shi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan

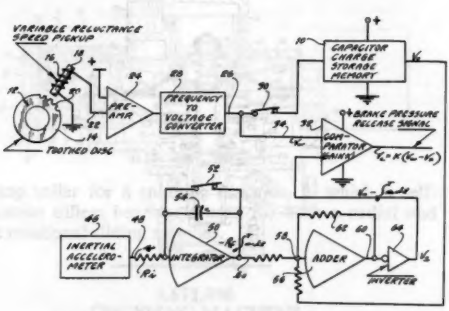
Filed Jan. 21, 1971, Ser. No. 108,516
Claims priority, application Japan, Jan. 22, 1970, 45/5,415
Int. Cl. B60t *13/00*
U.S. Cl. 303—6 C 6 Claims



A regulating device for controlling the brake pressure between front and rear brake cylinders in response to the

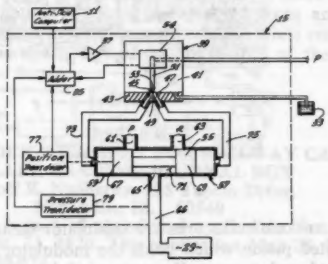
operation of a brake pedal causing the discharge of a pressure fluid from a master cylinder includes a system in which the master cylinder is connected to the cylinders of the front wheels for actuating them. The system includes a regulating device disposed between the front wheel fluid pressure connection and the rear wheel fluid pressure connection for providing a pressure balanced actuation of the rear wheel brake cylinders. The regulating device includes a housing having an inlet for the pressure fluid supplied by the master cylinder and an outlet spaced from the inlet for delivering the pressure fluid to the rear wheel brake cylinders. The housing defines a first inlet chamber which is connected to the inlet of the device and a second chamber which is connected to the discharge and two valve members are arranged to move within the respective chambers. The valve members are constructed and arranged such that the first one regulates the flow from the first chamber into the second and the second one regulates the flow through the outlet. The two valve members affect opening and closing of the respective chambers in accordance with the relationship between the effective cross-sectional areas of the both valve members and the force of two biasing springs. Communication between the first and second fluid chambers is thus established intermittently and causes an increase of the fluid pressure delivered to the rear wheels at a rate smaller than that which is delivered by the master cylinder. When the fluid pressure of the master cylinder exceeds a predetermined value, the second piston closes the outlet of the housing because of the fluid differential pressure between the two fluid chambers to maintain a constant fluid control pressure on the rear wheel control cylinders.

3,671,081
ELECTRONIC CONTROL SYSTEM FOR ANTISKID VEHICLE BRAKES
Zbigniew J. Jania, Northville, and Lawrence J. Vanderberg, Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jan. 15, 1970, Ser. No. 3,122
Int. Cl. B60t 8/08
U.S. Cl. 303—21 BE **12 Claims**



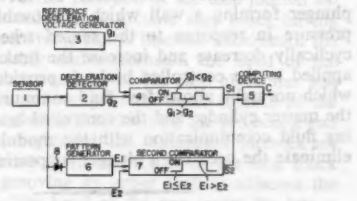
An antiskid brake system for wheeled vehicles comprising a brake pressure modulator for the vehicle wheel brakes which responds to wheel slip at the wheel road interface, the wheel slip being determined by a slip detecting system comprising two independent control signal sources, one signal being proportional to vehicle wheel speed and the other being a synthesized vehicle velocity signal resulting from integration of a deceleration signal, and a fast acting feedback system that induces a correction in anticipation of the control system response at the wheel brakes, thereby avoiding an instantaneous periodic locking of the brake system during the vehicle braking mode of operation as incipient skidding occurs.

3,671,082
ANTISKID SYSTEM
Curtis Edgar Stevens, Irvine, Calif., assignor to Bertea Corporation, Irvine, Calif.
Filed Mar. 4, 1970, Ser. No. 16,088
Int. Cl. B60t 8/08
U.S. Cl. 303—21 P **12 Claims**



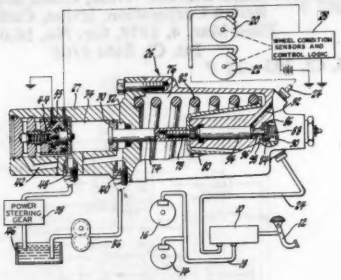
An antiskid system for a vehicle including a antiskid computer responsive to one or more skid parameters for providing an electrical control signal and a movable valve member for controlling the pressure of the fluid supplied to the brakes of the vehicle to thereby control the braking force. A position transducer provides a position feedback signal variable in accordance with the position of the valve element and a pressure transducer provides a pressure feedback signal variable in response to the absolute pressure of the fluid supplied to the brake. All of these signals are combined to provide a resultant signal, and a control device responsive to the resultant signal controls the position of the valve element to thereby control the pressure of the fluid supplied to the brake.

3,671,083
BRAKE PRESSURE CONTROL SYSTEM
Yoshihiro Matsumura, Yokosuka, Japan, assignor to Nippon Air Brake Company, Ltd., Fukiai-ku, Kobe, Japan
Filed Apr. 13, 1970, Ser. No. 27,898
Claims priority, application Japan, Apr. 21, 1969, 44/30,231
Int. Cl. B60t 8/08, 8/12
U.S. Cl. 303—21 BE **4 Claims**



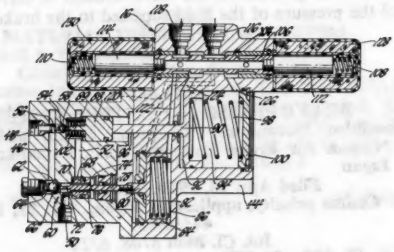
A brake pressure control system for a vehicle in which the deceleration detected by a sensor is compared with a reference deceleration for the on-off control of brake pressure. In the system, an additional on-off signal line is provided so as to eliminate undesirable locking of the wheels which is encountered inevitably with the conventional means for the on-off control of brake pressure.

3,671,084
ANTILOCK MODULATOR WITH MECHANICALLY RESETTABLE CONTROL VALVE
Charles D. Woodward, Louisville, Ky., assignor to General Motors Corporation, Detroit, Mich
Filed Oct. 6, 1970, Ser. No. 78,465
Int. Cl. B69t *8/10*
U.S. Cl. 303—21 F 4 Claims



An antilock brake pressure modulator includes a spring supported piston which holds the modulator check valve unseated and a normally open modulator control valve which is mechanically resettable when the piston reaches the end of its brake releasing stroke.

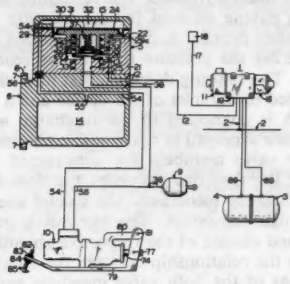
3,671,085
ANTILOCK BRAKE MODULATOR
James E. Pasek, Saginaw, Mich., and Charles D. Woodward, Louisville, Ky., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 12, 1970, Ser. No. 80,006
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 F 3 Claims



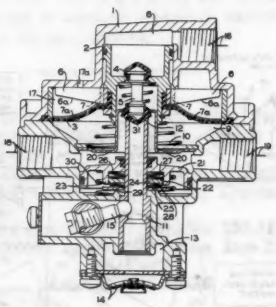
A brake antilock modulator of the type having a plunger forming a wall which is movable by hydraulic pressure in response to the sensed wheel condition to cyclically decrease and increase the brake fluid pressure applied to the controlled brake is provided with a valve which normally allows free fluid communication between the master cylinder and the controlled brake while blocking fluid communication with the modulator plunger to eliminate the need for a plunger supporting spring.

3,671,086
EMPTY-LOAD CHANGEOVER APPARATUS
Daniel G. Scott, Apollo, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Dec. 16, 1970, Ser. No. 98,564
Int. Cl. B60t *8/18*
U.S. Cl. 303—23 R 16 Claims

This invention relates to a brake cylinder pressure proportional valve device for interposition in a brake control pipe connecting a brake control valve and a brake cylinder and a novel mechanism adjustable accordingly as the vehicle is empty or loaded to cause the proportional valve device to operate only while the vehicle is empty and subsequent to a chosen build-up of an inshot pressure in the brake cylinder, to cut off flow of fluid under pressure from the brake control valve to the brake cylinder at a value proportional to the pressure established in the control pipe by the brake control valve for the reduction of pressure effected in the brake pipe.

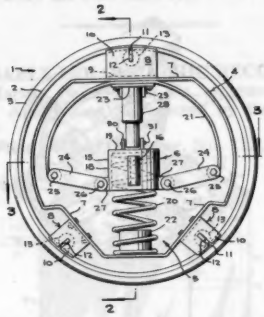


3,671,087
VARIABLE LOAD RELAY VALVE WITH BELLEVILLE SPRING TYPE LOCK FOR EXHAUST VALVE SEAT POSITIONED ACCORDING TO LOAD
Ewald Pekrul, Nienstedt, Germany, assignor to Westinghouse Bremsen- und Apparatebau G.m.b.H., Hannover, Germany
Filed Oct. 28, 1970, Ser. No. 84,824
Int. Cl. B60t *11/34*
U.S. Cl. 303—60 7 Claims



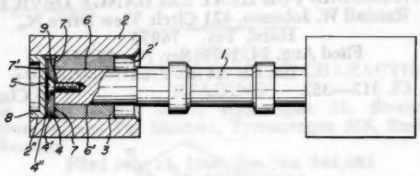
This invention relates to a fluid pressure operated Belleville spring type lock for a hollow sleeve member at one end of which is formed the exhaust valve seat of a paraboloidal type self-lapping variable load relay valve. This hollow sleeve is arranged to be held in a position to which it may be adjusted according to the load on a vehicle by the gripping action of the inner periphery of the smaller end of a Belleville spring in response to a fluid pressure force applied to the larger end by a piston subject to the delivery pressure supplied by the relay valve to one or more brake cylinders for effecting a brake application on the vehicle.

3,671,088
FLEXIBLE WHEEL
William P. Woolley, 3921 Cambridge St., Jackson, Miss. 39216
Filed July 22, 1970, Ser. No. 57,287
Int. Cl. B60b 9/02
U.S. Cl. 305—7 3 Claims



An internally sprung wheel wherein the wheel rim is rotatably supported upon rollers carried at circumferentially spaced points by a frame, and the frame is resiliently supported from a center member for attachment to a vehicle frame. The resilient mounting includes a coil spring from the center member to the base of the frame, and a leaf spring attached at its center to the frame top and having its free ends connected to links pivotally carried by the center member. A shock-absorber may be mounted between the center member and the frame top if desired.

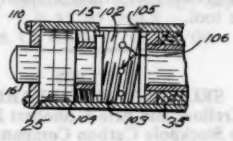
3,671,089
TOP ROLLER FOR SPINNING MACHINE
Nobukazu Morisaki, Nagoya, Japan, assignor to Daido Metal Company Ltd., Kita-ku, Nagoya, Japan
Filed Jan. 5, 1971, Ser. No. 104,017
Claims priority, application Japan, May 11, 1970, 45/39,984
Int. Cl. F16c 33/20, 35/02
U.S. Cl. 308—20 5 Claims



A top roller for a spinning machine, in which a self-lubrication oilless bearing is used for both a radial and thrust rotational sliding member.

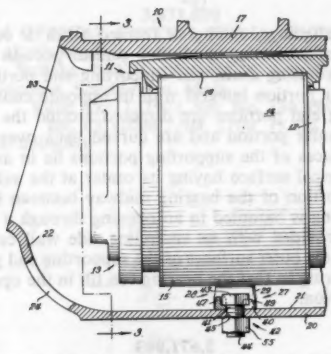
3,671,090
CHOPPING MACHINE
Harold E. Galanty, 36 Montgomery Road, Livingston, N.J. 07039
Continuation-in-part of application Ser. No. 690,946, Dec. 15, 1967. This application Sept. 11, 1970, Ser. No. 71,574
Int. Cl. F16j 15/54
U.S. Cl. 308—36.1 3 Claims

A chopping machine adapted to be connected to a duct, particularly, a pipeline through which pieces of solid material are being transported by a stream of fluid and comprising a grating unit having slots and a cooperating chopper unit having chopper blades. The blades pass through the slots with a small clearance whereby the larger size pieces are chopped to a size which will pass through the slots and the blades continuously clean the surfaces of the slots to maintain a low flow resistance. The stuffing box structure has an adjusting member which extends laterally thereof so as to be operable in a readily-accessible side



location and which may also serve to eject a shaft bearing. The mounting structure is supported from an end flange and extends some distance therefrom while remaining within the space defined by the planes of the side surfaces of the flange.

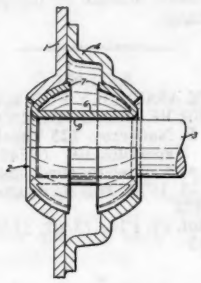
3,671,091
STOP BLOCK ASSEMBLY FOR RAILWAY CAR ROLLER BEARING JOURNAL BOX
Rudolf E. Nadherny, 125 Tupelo Drive, Naperville, Ill. 60540
Continuation-in-part of abandoned application Ser. No. 21,710, Mar. 23, 1970. This application May 28, 1971, Ser. No. 148,072
Int. Cl. F16c 13/02, 35/00
U.S. Cl. 308—40 17 Claims



To limit relative movement between the concave inner surface of the bottom wall of a railway journal box and an axle journal assembly therein, a stop block assembly is secured to the bottom wall. Prior to insertion of the axle journal assembly in the journal box, a cap screw is inserted from the inside of the journal box through an aperture in its bottom wall with the threaded end projecting therebelow. After insertion of the axle journal assembly in the journal box an arcuate stop block having an intermediate transverse slot is inserted underneath the axle journal assembly and underneath the head of the cap screw. The under surface of the stop block has less convexity than the concavity of the inner surface of the bottom wall so that when a locknut on the projecting end of the cap screw is tightened, the juxtaposed surfaces are brought into intimate contact. Flexing of the stop block is facilitated by grooving its upper surface adjacent the sides of the slot. The head of the cap screw fits into a socket in the stop block to prevent relative turning when the locknut is tightened. This also prevents accidental removal of the stop block should the locknut become loose. Modifications include arrangements for application of the cap screw from underneath the bottom wall eccentrically and centrally of an opening therein large enough to receive the head of the cap screw. A shoulder depending from the under surface of the stop block enters the large opening to locate the stop block and to elimi-

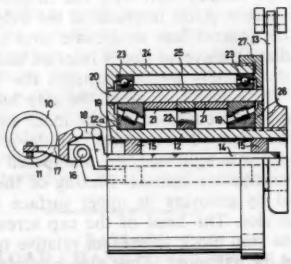
nate shear forces on the body of the cap screw resulting from impact on the stop block by the housing of the roller bearing. The stop block may be held in place by a "Huckbolt" pin having a hexagonal head or a round head with locking grooves to which a metal collar is applied by a suitable tool.

3,671,092
SELF-ALIGNING BEARING
Walter G. Krellner and Erle I. Shobert II, St. Marys, Pa., assignors to Stackpole Carbon Company, St. Marys, Pa.
Filed Mar. 29, 1971, Ser. No. 128,846
Int. Cl. F16c *23/00*
U.S. Cl. 308—72 **7 Claims**



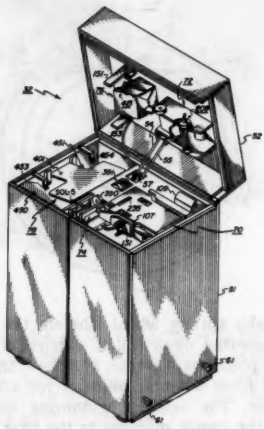
A self-aligning bearing is formed from a one-piece metal member having a tubular central portion for receiving a rotating shaft, and supporting end portions for the tubular portion integral with its opposite ends. These supporting end portions are disposed around the outside of the tubular portion and are curved back over it. The outer surfaces of the supporting portions lie in an imaginary spherical surface having its center at the axis of the tubular portion of the bearing midway between its ends. This bearing is mounted in an opening through a bearing support provided with an encircling side wall curved to fit against the outer surfaces of the supporting end portions of the bearing so that the bearing can tilt in the opening in any direction.

3,671,093
BEARING, PARTICULARLY FOR THE DRIVING MEANS OF AN OSCILLATING TOOL
Karl Wieck, Stuttgart, Germany, assignor to SUPFINA, Wieck & Hentzen, Remscheid, Germany
Filed July 30, 1970, Ser. No. 59,515
Int. Cl. F16c *19/02*
U.S. Cl. 308—183 **6 Claims**



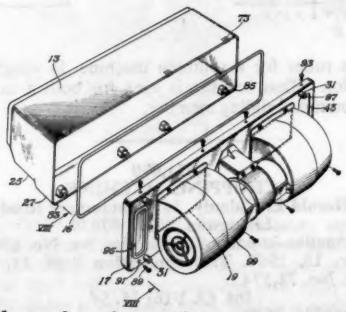
In a bearing assembly for a shaft oscillating with an amplitude of less than 360°, in order to eliminate localized wear of the track and rollers of the roller bearing forming part of the assembly, one of the races of said roller bearing is caused to rotate unidirectionally, driven by a freewheeling member connected to the oscillating shaft or its oscillating driving means.

3,671,094
COVER APPARATUS
Lyman H. Turner, Pittsford, and John A. Adamek, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Sept. 14, 1970, Ser. No. 71,776
Int. Cl. A47b *88/00, 95/00*; F05b *43/00*
U.S. Cl. 312—319 **3 Claims**



Cover apparatus for use with a sheet stacking unit in which the cover of the unit is connected to the frame by one or more rods which act against two different springs. One spring is relatively stiff to urge the cover to a slightly opened position when the cover is unlocked. The other spring is relatively compressible to act against the rod when the cover is raised to its fully opened position. Circuitry is coupled to the cover locking device to effect a pop open action when a signal is received to unlock and also to a tray below the cover to raise the tray when the cover is fully extended.

3,671,095
ENCLOSURE FOR HEAT EXCHANGE DEVICE
Randall W. Johnson, 421 Circle View Drive N., Hurst, Tex. 76053
Filed Aug. 24, 1970, Ser. No. 66,364
Int. Cl. A47b *77/08*
U.S. Cl. 312—352 **16 Claims**



An enclosure for a heat exchange device in which air is blown past a heat exchange coil, characterized by a one-piece coil case having a length longer than any of the heat exchange coils that may be employed with it and readily cut off at an appropriate length to fit the selected heat exchange coil; a dam or seal adapted to be fastened along the bottom rear of the coil case and having a drainage connector for draining condensate from within the

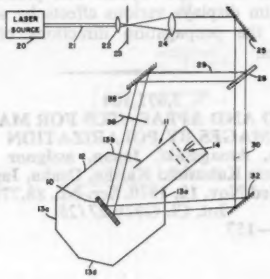
coil case, and a removable back plate for connecting with the coil case. The removable back plate has a relatively large aperture for connection with the blower means circulating the air past the heat exchange coil and a plurality of other apertures arranged so that the back plate may be rotated 180° to facilitate most advantageous use of space. Other specific structural features and the method of forming the enclosure are also disclosed.

3,671,096

ERASABLE HOLOGRAPHIC RECORDING

Arthur S. Mackin, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of the Navy

Filed Feb. 3, 1971, Ser. No. 112,167
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 13 Claims



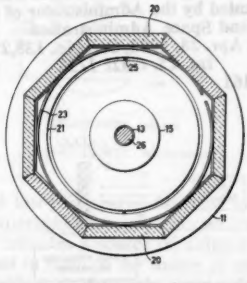
A holographic system records optical information on alkali halide crystals. The crystals are irradiated with an electron beam producing defects in the crystalline structure. The primary defect is in the F band although a small number of M bands are formed at the same time. The wavelength of a laser beam used for recording falls within the F absorption band. This converts the F centers to R and M centers. Reconstruction of the hologram can be made with light whose wavelength falls within either the F, R or M absorption band, the F band being destructive and the R and M bands nondestructive. The recorded information can be erased by exposing the crystal to an electron beam.

3,671,097

ARRANGEMENT IN OPTICAL CHARACTER READING

Nils Evert Johan Stahl, Hjortstigen 18, Stocksund, Sweden, and Per Skonare, Tyresovagen 355, Enskede, Sweden

Filed July 12, 1968, Ser. No. 744,403
Int. Cl. G02b 17/00
U.S. Cl. 350—7 1 Claim



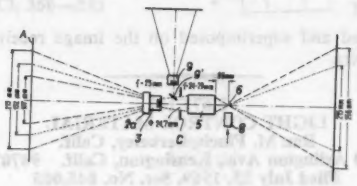
Characters are read from a character carrier by means of a rotatable mirror having two brackets with slots and a plurality of reflecting elements located in these slots and forming a substantially continuous optical surface.

3,671,098

OPTICAL DEVICE HAVING TWO PARTS PRODUCING FIXED INTERMEDIATE IMAGE

Johann Rotter, Ernest Thun-Str. 6, 5020 Salzburg, Austria

Filed Sept. 2, 1969, Ser. No. 854,423
Claims priority, application Germany, Sept. 4, 1968, P 17 97 250.8
Int. Cl. G02b 21/00, 23/00
U.S. Cl. 350—8 12 Claims



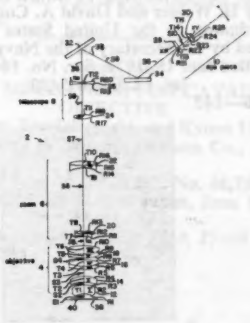
An optical device comprising two optical parts, each of which has an image-forming member. In operation, one optical part is disposed nearer an object and the other is disposed nearer an image formed by the device, the optical parts being spaced apart so as to form a real intermediate image therebetween. The effective field diameter of one or both image-forming members is variable by alteration of at least one optical part.

3,671,099

ZOOM OPTICAL SYSTEM FOR A MICROSCOPE

Arthur H. Shoemaker, East Aurora, and Milton H. Sussman, Buffalo, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 1, 1971, Ser. No. 130,396
Int. Cl. G02b 7/04, 1/00, 15/04
U.S. Cl. 350—43 4 Claims



A ten component microscope system having a variable magnification of 90×–550× and a variable NA of respectively 0.16–0.55.

3,671,100

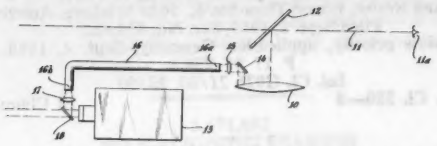
SYSTEM FOR INTEGRATING GUNSIGHT RETICLE IMAGE AND IMAGE RECEIVED BY A CAMERA

Bliss M. Bushman, Claremont, and William D. Schultz, Bradbury, Calif., assignors to The Perkins-Elmer Corporation, Norwalk, Conn.

Filed Oct. 23, 1970, Ser. No. 83,485
Int. Cl. G02b 21/00, 23/00
U.S. Cl. 350—19 7 Claims

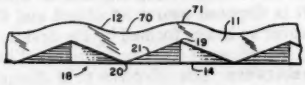
For integrating an aircraft gunsight or HUD (head up display) reticle image and an image received by a camera mounted in the aircraft with its lens aimed to photograph a view corresponding to the view through the reticle, an image of the reticle from an edge portion of a collimating lens which is associated with the gunsight

reticle is focussed onto one end of the bundle of optical fibers. At the other end of the bundle the reticle image is



collimated and superimposed on the image received by the camera.

3,671,101
LIGHT CONTROL MATERIAL
Ran M. Finch, Berkeley, Calif.
(200 Arlington Ave., Kensington, Calif. 94707)
Filed July 25, 1969, Ser. No. 845,005
Int. Cl. G02b 5/12
U.S. Cl. 350—109 **3 Claims**



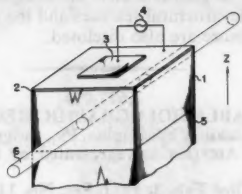
A sheet of light transmitting material is provided on its light exit side with a plurality of geometric surfaces, preferably right regular hexaginal pyramids, whose surfaces define an angle with the plane of said sheet sufficient to totally reflect all light rays entering the light entrance side at an angle of incidence exceeding a given angle and which have not passed through the sheet.

3,671,102
LAMELLAR EUTECTIC INSB SB FILMS AS INFRARED POLARIZERS
Arthur R. Clawson, San Diego, Neil M. Davis, Riverside, and Harry H. Weider and David A. Collins, San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy
Filed Jan. 15, 1971, Ser. No. 106,800
Int. Cl. G02b 5/30
U.S. Cl. 350—147 **1 Claim**

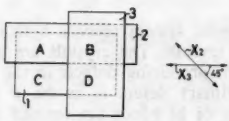
An optical polarizer of lamellar eutectic InSb+Sb films grown by electron beam microzone crystallization, for use in the infrared region beyond 6 microns wavelength.

3,671,103
DI-LEAD MOLYBDATE ULTRASONIC LIGHT DEFLECTOR
Naoya Uchida, Tokyo, Yoshiro Ohmachi, Tokorozawashi, and Nobukazu Niizeki, Shintaro Miyazawa, and Hiroshi Iwasaki, Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan
Filed Mar. 31, 1971, Ser. No. 129,860
Claims priority, application Japan, Apr. 9, 1970, 45/30,383; July 13, 1970, 45/61,673, 45/61,674, 45/61,675
Int. Cl. G02f 1/24
U.S. Cl. 350—149 **6 Claims**

A single crystal of di-lead molybdate, Pb_2MoO_5, that is $2PbO \cdot MoO_3$, is used as a medium for ultrasonic deflection of light. The light deflecting medium of the present invention enables light and ultrasonic waves transmitting therethrough to be interacted acousto-optically with higher efficiency than that of the prior art and that using tellurium dioxide as the single crystal. The present light deflecting medium displays various effects by several combinations of the propagation directions of light and acoustic waves.

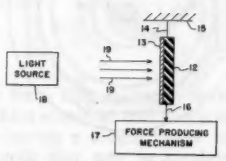


3,671,104
METHOD AND APPARATUS FOR MASKING IMAGES BY POLARIZATION
Kuniki Seino, Amagasaki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 12, 1970, Ser. No. 88,778
Int. Cl. G02b 27/28
U.S. Cl. 350—157 **9 Claims**



Two doubly refracting plates whose optic axes are at 45° with each other and an image-bearing film are placed between two optical polarizers which are so disposed that their optic axes (principal crystallographic axes) are rotatable. By rotating the optical polarizers, the polarizers are set at such position that their optic axes are at a right angle or in parallel with each other, while at the same time either one of the optical polarizers and either one of the doubly refracting plates are set in such position that their optic axes are at an angle of 45° with each other. Thus, part of the image can be masked as desired.

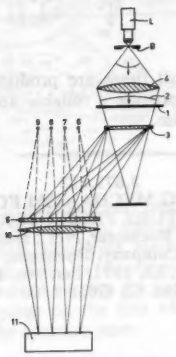
3,671,105
LIGHT REGULATOR
Jerry G. Williams, Hampton, and Joseph H. Judd, Newport News, Va., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Apr. 28, 1971, Ser. No. 138,227
Int. Cl. G02f 1/36
U.S. Cl. 350—161 **4 Claims**



A thin absorbing metallic film deposited on a low-modulus transparent substrate and a mechanism for stretching

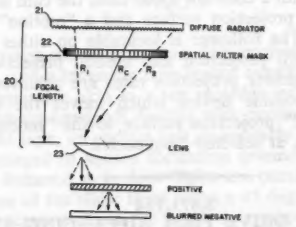
the substrate. As the substrate is stretched, the thickness of the thin film decreases and microfractures occur thereby allowing an increase transmission of visible light through the thin film.

3,671,106
OPTICAL MULTIPLEX FILTER SYSTEM
Gunther Groh, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 8, 1970, Ser. No. 70,339
Claims priority, application Germany, Sept. 5, 1969, P 19 45 085.2
Int. Cl. G02b *5/18*
U.S. Cl. 350—162 SF **10 Claims**



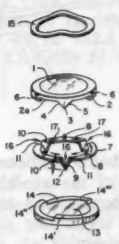
A character recognition apparatus uses a holographic image multiplier to project an observed image in angularly separated beams. In the path of each beam an optical spatial filter is placed. By virtue of the image multiplication the shape of the observed character may be simultaneously processed.

3,671,107
OPTICAL LOW-PASS SPATIAL FILTERS
George Biernson, Concord, Raymond Euling, Sudbury, and Paul W. Jones, Franklin, Mass., assignors to Sylvania Electric Products Inc.
Original application Oct. 29, 1968, Ser. No. 771,585, now Patent No. 3,615,433. Divided and this application Oct. 5, 1970, Ser. No. 78,266
Int. Cl. G02b *27/00*
U.S. Cl. 350—162 SF **1 Claim**



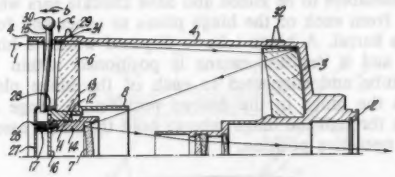
An optical low-pass spatial filter for low pass spatially filtering photographic imagery information. The low-pass spatial filter includes a source of diffused illumination, a mask disposed in front of the source of diffused illumination and having a circularly-symmetric transmissivity pattern, and a lens spaced in front of the mask a distance equal to the focal length of the lens for refracting illumination directed thereon from the source of illumination after passage through the mask.

3,671,108
TEMPERATURE COMPENSATING DEVICE AND LENS SYSTEM INCLUDING SAME
Alfred Kilgus, Biberacher Strasse 2, Stuttgart-Wangen, Germany
Filed July 10, 1970, Ser. No. 53,878
Claims priority, application Germany, July 12, 1969, G 69 27 722.1
Int. Cl. G02b *7/02*
U.S. Cl. 350—253 **11 Claims**



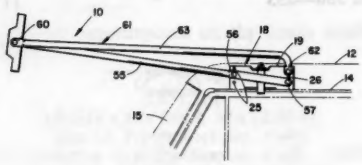
A lens system includes an annular temperature compensating ring disposed between lens components, the ring having a thermal coefficient of expansion which is sufficiently high to compensate for changes in the focal length of the lens system resulting from temperature-induced changes in the refractive index of the lens elements. In a preferred embodiment, the temperature compensating device comprises a plurality of V-shaped projections extending axially from one side of the annular ring, the shape of the projections and of the notches defined thereby being such that the axial length of the projections changes with temperature-induced changes in the size of the ring.

3,671,109
FOCUSING MECHANISM FOR CATADIOPTRIC OBJECTIVE
Shigeaki Sugano, Tondabayashi, and Kyozo Uesugi, Sakai, Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan
Filed June 16, 1970, Ser. No. 46,714
Claims priority, application Japan, June 19, 1969, 44/48,607
Int. Cl. G02b *5/10, 7/10, 17/08*
U.S. Cl. 350—299 **9 Claims**



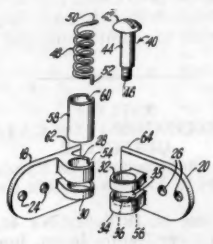
An adjustable focus multi-reflector optical device such as of the cassegrainian or catadioptric type includes a main barrel supporting a stationary first reflector, and a smaller diameter internally threaded sleeve coaxially mounted in the main barrel. An externally threaded collar mounting a second reflector is located in and engages the thread in the sleeve and a handle extends radially from the collar through a peripheral slot in the main barrel and is rotatable with the collar and connected thereto so as to be resiliently axially and radially movable relative to the collar.

3,671,110
REAR VIEW MIRROR ATTACHMENT
Sarfien V. Van Wassenhove, 2173 18th St., East Moline, Ill. 61244
Filed July 8, 1970, Ser. No. 53,190
Int. Cl. G02b 5/08
U.S. Cl. 350—307 10 Claims



A rear view mirror that is positioned outside of the automobile and forwardly of the windshield at a level above the roof of the automobile. The mirror is supported in cantilever fashion by supporting structure connected to brackets fixed to the respective left- and right-hand gutters running lengthwise of the edges of the automobile roof.

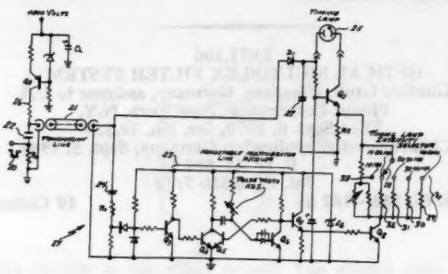
3,671,111
BIASED HINGE FOR SPECTACLE FRAMES
Luke Okner, Short Hills, N.J., assignor to Standard Optical Mfg. Company, Livingston, N.J.
Filed Oct. 12, 1970, Ser. No. 79,843
Int. Cl. G02c 5/16
U.S. Cl. 351—113 10 Claims



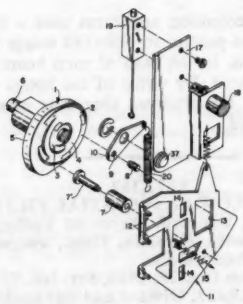
A biased hinge, particularly suited for joining the temple arms of spectacle frames to the lens-engaging means of spectacle frames. Two hinge plates are fastened to the members to be joined and have knuckle ears which extend from each of the hinge plates to coact and form a hinge barrel. A hinge tube is disposed within a hinge barrel and a resilient means is positioned within the hinge tube and connected to each of the hinge plates to bias the hinge in the desired position. A hinge pin extends through the hinge tube to hold the hinge assembly in operative position.

3,671,112
REFERENCE TIME SCALE APPLICATION TO HIGH SPEED FILM AT HIGH PULSE REPETITION RATES
Andrew E. Lennert and Frank L. Crosswy, Tullahoma, and Henry T. Kalb, Manchester, Tenn., assignors to the United States of America as represented by the Secretary of the Air Force
Filed Mar. 18, 1971, Ser. No. 125,571
Int. Cl. G03b 41/00
U.S. Cl. 352—84 4 Claims

An apparatus for applying a reference time scale to high speed film utilizing a neon timing light source, a timing signal generator and a transmission line to connect the generator to the light source. Timing pulses having fast rise and fall times are produced at high pulse repetition rates to provide a reliable application of timing marks to the film.



3,671,113
FILM FEEDING MECHANISM FOR MOTION PICTURE PROJECTORS
Robert B. Johnson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 15, 1971, Ser. No. 124,092
Int. Cl. G03b 1/00
U.S. Cl. 352—173 8 Claims

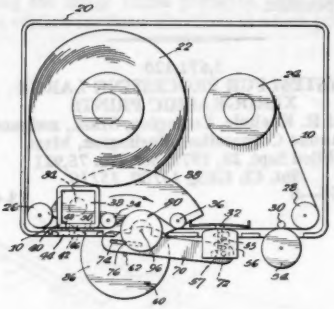


In a film feeding mechanism of the type wherein the engagement of the film claw is effected by a cam follower cooperating with a constant speed cam, the cam is formed with a "still" projection surface and a "motion" projection surface. The follower is locatable on either surface to establish still projection and motion projection at a set rate, and slower projection rates are achieved by an electrically actuable device which moves the follower from the "still" projection surface to the "motion" projection surface at selected frequencies.

3,671,114
ECCENTRIC DRIVE FILM ADVANCING SYSTEM
Michael D. Thomas, 640 Fern Court, Elmhurst, Ill. 60126, and Sidney Milovac, 10521 S. Kostner, Oak Lawn, Ill. 60453
Filed Apr. 28, 1970, Ser. No. 32,649
Int. Cl. G03b 1/34
U.S. Cl. 352—185 23 Claims

A film advancing system for use with non-apertured continuous film (such as motion picture film) that carries successive areas for pictures, together with sequencing signals coordinated with the successive areas. While the forward portions of the film near the exit end of the film

advancing path are driven at a constant speed, the following portions of the film are advanced intermittently by a member that periodically applies a lateral force against an intermediate portion of the film to pull a length of the film past an aperture plate. The intermittent film advancing mechanism is driven in response to the sequencing signals carried by the constantly advancing film, which sig-



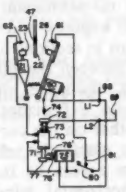
nals are picked up by a magnetic head, and a light stopping means (such as a shutter member) cooperates with the intermittent film advancing mechanism to stop the light from radiating along its normal path to the film while the film is being advanced past the aperture plate, and to allow light to impinge on the film when the film is stationary adjacent the aperture plate.

3,671,115

AUDIO-VIDEO SYSTEM EMPLOYING SOUND TRACK TAPE BELTS MOVABLY MOUNTED ON PROJECTION SLIDES

Sam Larkin, 254 Beach 140th St.,
Belle Harbor, N.Y. 10013

Filed Jan. 30, 1970, Ser. No. 7,052
Int. Cl. G03b *21/64, 31/04*
U.S. Cl. 353—19 12 Claims



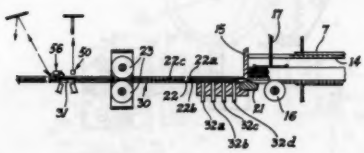
The system shown includes a slide projector with a slide changer, and a magnetic tape record associated with electronic apparatus akin to a tap recorder including a magnetic pick-up head, all dealing with projection slides on which the tape, an endless belt, is movably mounted. The belt, arranged in square formation around the transparency, is flattened so its four flights are parallel to the general plane of the slide; there being a 45 degree fold line in the belt across each corner where it is supported on edges on the slide body. The sound track is along a line once around one face of the belt with a conductive spot between start and finish. Opposite cut-outs in the slide expose both belt surfaces. The magnetic head is one jaw of a normally open clamp form while a powered friction drive wheel is the other jaw. The clamp is closed upon actuation of a solenoid, whereupon said magnetic head and rotating wheel enter the cut-outs to pinch the tape, thus causing it to move and its track played. Conductive spring fingers on the clamp arms also pinch the tape upon the closing of the clamp, and making contact with said spot, constitute a switch in a circuit including said solenoid and a locking relay device, operating automatically to cause the clamp to open when playing is done.

3,671,116

READER FOR INFORMATION CARRIERS IN SHEET FORM

Manfred Leutwein, Rommelshausen, and Heinz Streicher, Echterdingen, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 12, 1969, Ser. No. 875,792
Claims priority, application Germany, Dec. 19, 1968, P 18 15 762.5
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 16 Claims



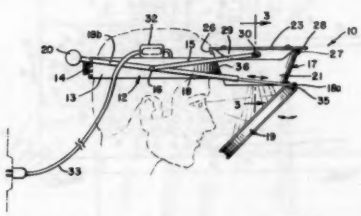
Apparatus is disclosed for projecting images from information bearing media such as microfiche cards having at least first, second and third image portions, the projection apparatus including first and second stations (or magazines) for receiving a plurality of the image bearing media, a feed path disposed between the first and second stations, first and second projection stations for receiving one of the information bearing media as it is directed along the feed path, and first and second projection assemblies disposed with respect to one of the projection stations for projecting the first and second images from the information bearing medium. In a preferred embodiment, the first and second image portions may be displayed upon a projection screen and one of the lens systems may be movable with respect to the information bearing medium to thereby project the third image portion.

3,671,117

VIEWING DEVICE

David W. Tibbets, 7850 Lime Grove Ave.,
West Melbourne, Fla. 32901

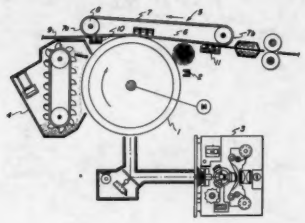
Filed Sept. 14, 1970, Ser. No. 71,642
Int. Cl. G03b *21/00, 21/06, 21/26*
U.S. Cl. 353—28 7 Claims



A supporting frame positioned on the head of a viewer carries a transparent reflecting screen and an episcope type projector which includes a holder for an object to be viewed and illuminating means, arranged so that an image of the object is projected on the screen. An inclination-responsive switch in circuit with the illuminating means energizes the latter only when the viewer's head

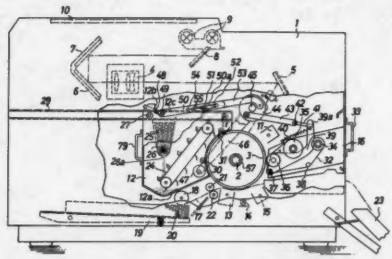
is level, and de-energizes the same when the viewer's head is tilted forwardly and downwardly for viewing another object in coordination with the projected image.

3,671,118
APPARATUS FOR CREATING DUPLEX REPRODUCTIONS
Joseph Fantuzzo, Webster, and Frazer D. Punnett, Penfield, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed Dec. 24, 1969, Ser. No. 887,845
Int. Cl. G03b *27/32*
U.S. Cl. 355—3 **7 Claims**



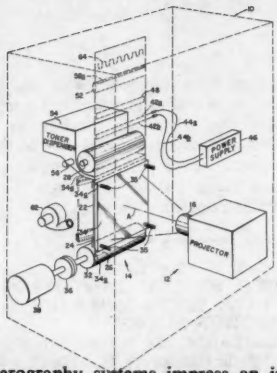
A duplexing method and apparatus for producing duplicate reproductions of original subject matter on opposite surfaces of a support material. Two oppositely reading latent electrostatic images of subject matter to be reproduced are created on a photosensitive surface and are developed with developer material wherein one of the images comprises a right reading image which is transferred to a storage medium after development. The other image being in wrong reading or mirror form remains on the photosensitive surface to be directly transferred therefrom to one side of a support material whereupon the developed image retained on the storage medium is transferred to the other side of the support material to create a duplex reproduction.

3,671,119
ELECTROSTATIC COPYING APPARATUS
Herbert Engel, Munich, Karl Hartwig, Unterhaching, and Gunther Schnall, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Dec. 10, 1970, Ser. No. 96,937
Claims priority, application Germany, Dec. 10, 1969, P 19 61 834.9
Int. Cl. G03g *15/08*
U.S. Cl. 355—3 **10 Claims**



A xerographic carrier has a photoconductive layer which is to be uniformly charged preliminary to transfer of latent images to the layer. A source of powdered electroscopic developer material supplies such material to a conveying device located adjacent the path and capable of displacement between two positions in one of which it is directly proximal to the layer and in the other of which it is remote therefrom so as to permit withdrawal of the carrier from its normal operating position. A reversible drive normally drives the conveying arrangement in a sense conveying the powdered developer material onto the layer of the carrier, and a displacing arrangement serves for displacing the conveying device from its normal operating position to its remote position. Reversing means is provided which serves to reverse briefly the drive when the displacing means is operated, for displacing the conveying arrangement from its normal operating position to its remote position.

3,671,120
SYSTEM FOR PROCESSING LARGE XEROGRAPHIC PRINTS
Manfred R. Kuehnle, Lexington, Mass., assignor to Audac Corporation, Burlington, Mass.
Filed Sept. 28, 1970, Ser. No. 75,921
Int. Cl. G03g *15/00, 15/10*
U.S. Cl. 355—8 **13 Claims**

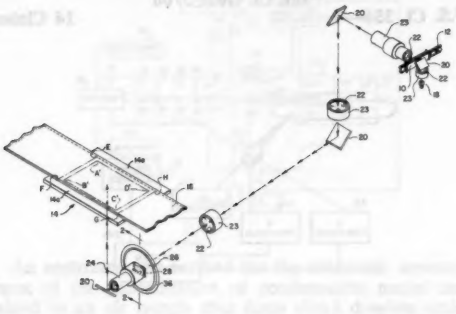


Present xerography systems impress an image on an electrostatic sheet or film by charging the entire area of the sheet and then exposing that area to the image and then applying toner to that area to develop the image impressed on the film to permanent visible form. The present system charges, exposes and tones a large area electrostatic sheet or film in sections by positioning a vertically moving curtain between the film and the lens system. Horizontal corona discharge producing electrodes, a horizontal window and a horizontal wiper blade are spaced one above the other on the curtain. As the curtain moves downward, the electrodes charge progressively lower areas of the film across its full width. Then the downwardly moving horizontal window exposes these areas, in turn, to progressively lower portions of the image projected from the lens system so that a latent image is found on the film. Finally, the downwardly moving wiper blade spreads toner from an adjacent supply uniformly over progressively lower areas of the exposed film so that a high-quality visible image is impressed on the film.

3,671,121
EXPOSURE DEVICE FOR CONTROLLING CHARGE ON A PORTION OF A CHARGED SURFACE BORDERING AN IMAGE FRAME PROJECTED ON THE CHARGED SURFACE
Donald J. Albert, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 5, 1970, Ser. No. 61,119
Int. Cl. G03g *15/00*
U.S. Cl. 355—7 **25 Claims**

A mechanism and method is disclosed for controlling charge on a portion of the surface of a photoconductive member bordering an image frame, containing an image

and a background portion projected onto the photoconductive surface from an original such as microfilm, wherein positive microfilm is dark or opaque between and around adjacent image frames and negative microfilm is transparent or light transmitting between and around adjacent image frames. The mechanism has an aperture through which the image frame is projected, surrounded by an opaque mask portion for preventing illumination of the border area on a charged photoconductive surface surrounding the image frame projected onto the photoconductive surface for those situations in which positive prints



are made from negative microfilm. The mechanism further includes a light directing mask portion surrounding the aperture which, when activated, directs illumination onto a portion of the charged surface of the photoconductive surface bordering the image frame projected thereon for discharging the border portion for those situations in which positive prints are made from positive microfilm. Thus, in all situations the charge on the border portion of a photoconductive surface adjacent the image frame is maintained at substantially the same potential as background portions within the image frame.

3,671,122

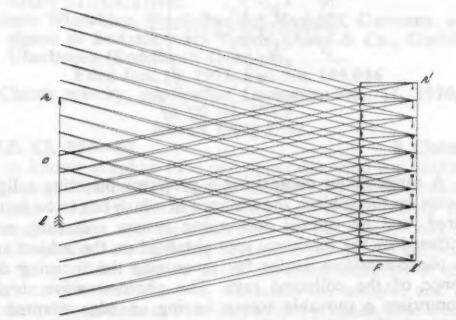
METHODS OF PRINTING STEREOSCOPIC INTEGRAL PHOTOGRAPH FROM PSEUDOSCOPIC ORIGINAL

Leslie Peter Dudley, Los Angeles, Calif., assignor to Dudley Optical Laboratories, Inc., Beverly Hills, Calif.

Original application July 26, 1968, Ser. No. 747,996. Divided and this application Oct. 2, 1970, Ser. No. 77,606

Int. Cl. G03b *35/02*

U.S. Cl. 355—22 **2 Claims**



Photographs of the integral type are provided which exhibit the effect of parallax about both horizontal and vertical axes, the photographs being recorded on a spherically lenticulated film or on a spherically lenticulated screen-film combination; and a method, comprising a sequential printing technique, is provided by which the elementary images constituting the composite pictures are so transposed that a stereoscopic reproduction from a pseudoscopic integral photograph is achieved.

3,671,123

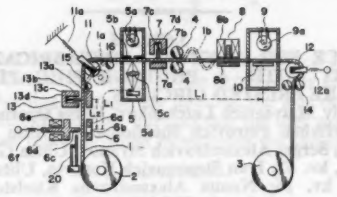
DEVICE FOR INSURING REGISTRATION OF THE PICTURE FRAME WITH THE PRINTING STATION IN MAKING PRINTS FROM A FILM

Tomoji Murata, Sakai-shi, Osaka-fu, and Atsuyuki Tanaka, Toyonaka-shi, Osaka-fu, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 22, 1970, Ser. No. 39,827

Int. Cl. G03b *27/04*

U.S. Cl. 355—97 **9 Claims**



A printing apparatus for sequential printing of pictures from images appearing in a plurality of frames disposed in sequence on a film not provided with perforations, including a first detecting means for detecting the passing of a front edge of a picture frame of the film transported by a transport means, and a second detecting means, actuated when said first detecting means detects the front edge of a certain picture frame to operate a film stop means and an exposure means when a film travel distance corresponding to the distance between the first detecting means and said exposure means is detected.

3,671,124

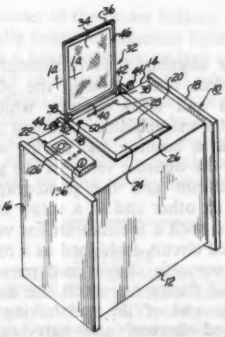
MICROFILM DUPLICATOR AND METHOD OF PHOTOCOPYING MICROFILMS

William Amolsch, Detroit, and Robert J. Maher, Farmington, Mich., assignors to Douthitt Corporation, Detroit, Mich.

Filed Sept. 4, 1970, Ser. No. 69,826

Int. Cl. G03b *27/04*

U.S. Cl. 355—124 **8 Claims**



An apparatus to simultaneously duplicate a large plurality of microfilm negative material supported on a transparent sheet by ultra-violet photo process in which the

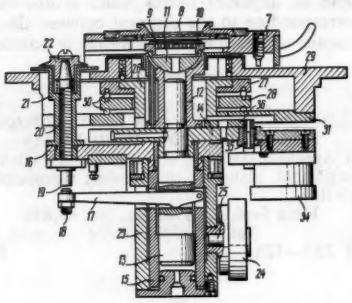
apparatus has a glass window which supports the transparent sheet and a photosensitive lamina placed on top of the transparent sheet, an ultra-violet rays emitting device is supported in the lower section of the apparatus which also supports an automatic fast acting shutter mechanism disposed between the ultra-violet ray emitting device and the glass window which supports the microfilm transparency. In the process of photo-copying a cover is displaced over the glass window to keep out sun rays or artificial, external light rays and the space between the cover and the glass window, when the cover is closed, is automatically evacuated of air to tightly press the photosensitive lamina onto the transparent microfilm sheet just prior to opening the shutters, to expose the microfilm negative to the ultra-violet rays for transfer of the image to the photosensitive lamina. The operating mechanisms for the shutter and for evacuating of the protective cover are correlated and provided with suitable controls to function in timed sequence.

3,671,125

DEVICE FOR ALIGNING PREFABRICATED CIRCUIT WITH A PHOTOGRAPHIC PLATE TO MAKE PRINTED CIRCUITS

Anatoly Matveevich Lutchenkov, Ulitsa Opernaya 9b, kv. 1; Mikhail Petrovich Shekhodanov, Ulitsa Shirotnaya 7–8; Sergei Alexandrovich Siyanov, Ulitsa Gorlovskaya 7/9, kv. 62; Ivan Stepanovich Korovin, Ulitsa Radistov 8a, kv. 16; Nonna Alexandrovna Kholstova, Ulitsa Ulyanova 9, kv. 7; Valentina Nikolaevna Kreptseva, 1 Nagorny mikroraion 28–88; and Nina Petrovna Leskovskaya, Ulitsa Zayarskaya 18, kv. 8, all of Gorky, U.S.S.R.

Filed Nov. 13, 1970, Ser. No. 89,372
Int. Cl. G02b *7/00*
U.S. Cl. 355—133 **3 Claims**



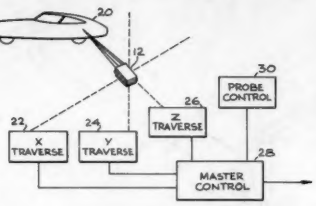
A device for aligning a prefabricated circuit with a photographic plate and exposing the plate to produce printed circuits and solid circuits, which comprises a microscope and a manipulator including a main micrometer mounted in a bushing and having at its one end a dial for setting the optimal value of the gap between the prefabricated circuit and the photographic plate, and terminating at its other end in a screw tip; the device is further provided with a mechanism for vertically moving the prefabricated circuit, fashioned as a rod with a flange, mounted in a movable sleeve, said movable sleeve also having a second flange on which the flange of the rod rests, the upper end of the rod having a support hub loosely mounted thereon and carrying a hemisphere which has a microscope table disposed thereon, the sleeve having a lever pivotally secured thereon, resting upon the rod and operatively connected with the pivot of the main micrometer screw, and the flange of the sleeve having a bushing of the main micrometer screw rigidly secured therein. The device provides a very accurate and precise alignment of a prefabricated circuit with a photographic plate, which alignment does not get disturbed during subsequent securing of the circuit and the photographic plates prior to exposure of the photographic plate.

3,671,126

NONCONTACTING OPTICAL PROBE

Gilbert E. Erb, Los Angeles, Calif., assignor to Ati, Inc.

Filed Feb. 19, 1970, Ser. No. 12,574
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 **14 Claims**



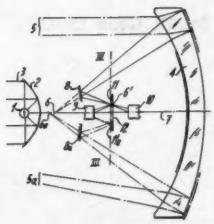
A distance measuring device for deriving contour information without contacting the surface being measured and without the use of internal moving parts. The device utilizes an optical system and geometric triangulation techniques to develop electrical output signals which may be used to drive readout displays, numerically controlled machine tools or the like.

3,671,127

LIGHT BEAM RANGE-FINDER

Giovanni Odone, la Rosiaz S/Lausanne, and Christian Lietar, Yverdon, Switzerland, assignors to Paillard S.A., Sainte-Croix, Switzerland

Filed Sept. 14, 1970, Ser. No. 71,926
Claims priority, application Switzerland, Sept. 10, 1969, 15,233/69
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 **6 Claims**

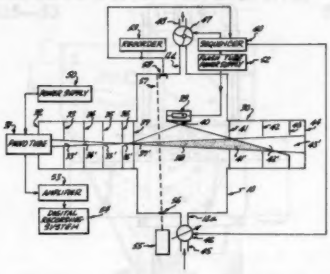


A range-finder comprising a projector directing a light beam on the subject, the distance of which has to be measured, and an optical converging system collecting rays diffused by the luminous spot obtained on the subject and a photo-sensitive device for measuring the focusing distance of the collected rays. The photo-sensitive device comprises a movable screen having an edge adapted to separate the rays near the converging point to differentially direct them onto two photo-elements. Means are provided to prevent parasitic light rays to impinge on the photoelements.

3,671,128
AUTOMATIC CLOUD CONDENSATION NUCLEI COUNTER

Lawrence F. Radke, Seattle, and Peter V. Hobbs, Bellevue, Wash., assignors to Battelle Development Corporation, Columbus, Ohio

Filed Aug. 25, 1969, Ser. No. 852,786
Int. Cl. G01n *1/00, 15/00*
U.S. Cl. 356—37 8 Claims



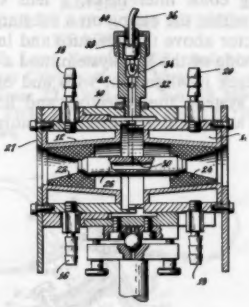
An apparatus and method for the automatic measurement of the concentration of condensation nuclei contained in an air sample that form cloud droplets under conditions closely approximating those of natural clouds. An air sample containing condensation nuclei is introduced into a thermal diffusion chamber which is maintained at a supersaturation approximating that of natural clouds and the condensation nuclei are allowed to grow to a certain uniform size. The droplet size is measured directly by means of a photocell observing the light scattered by the droplets at a forward angle from a monochromatic light source. When the droplets reach the desired size, an enhancement in scattered light occurs which is detected by the photocell. Alternatively, the droplet size is measured indirectly by a timer which defines a fixed time interval after the air sample introduction, given the supersaturation in the thermal diffusion chamber. An electrical signal from either the photocell or the timer then triggers an integrating nephelometer which simultaneously measures the extinction coefficient due to light scattering of the cloud droplets. The known droplet size and observed extinction coefficient are combined in a simple manner to determine the concentration of cloud condensation nuclei.

3,671,129
GRAPHITE TUBE SPECTROSCOPY SAMPLE CELL INCLUDING ILLUMINATION AND OBSERVATION STRUCTURE

Elmar Wiedeking, Sipplingen am Haslrain, Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen (Bodensee), Germany

Filed Jan. 12, 1971, Ser. No. 105,916
Claims priority, application Germany, Feb. 11, 1970, G 70 04 574.8
Int. Cl. G01j *3/02*
U.S. Cl. 356—85 2 Claims

A known graphite tube cell apparatus used for heating an atomic absorption sample includes an outer housing within which the heated graphite tube is completely enclosed (except for the open ends of the tube), both to maintain the non-oxidizing protective gas on the surfaces of the graphite tube to avoid its being oxidized at the high temperatures used to dissociate the sample, and to contain the radiation from the red-hot graphite tube when so heated. Because of the closed and opaque nature of the housing, it is difficult to introduce the sample into a small inlet opening in the graphite tube. A hollow attachment on and extending through the outer housing is provided, in which a light source is contained for illuminating the sample inlet opening. The end of the attachment remote from the cell is sealed, and the inlet for the protective gas extends through the wall of the attachment at a position between the light source and the other end

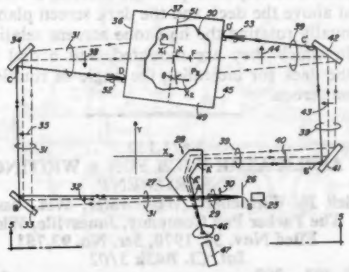


near the cell so as also to cool the lamp when the cell is heated. A visual observing device is preferably provided on and extending through the housing, the axis of which also intersects the sample inlet, so that the user may conveniently see this inlet when introducing the sample.

3,671,130
INTERFEROMETER OF THE CENTER BALANCE TYPE

John Kent Bowker, Marblehead, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed July 10, 1970, Ser. No. 53,770
The portion of the term of the patent subsequent to Aug. 3, 1988, has been disclaimed
Int. Cl. G01b *9/02*
U.S. Cl. 356—106 16 Claims



An interferometer of the center balance type incorporating a substantially isotropic, coherent light source, a retroreflector having a beam splitting surface and a stage plate comprising a pair of opposed parallel mirrors in the optical path. The optical path difference is proportional to the distance from the optical fiducial to a plane equidistant from and parallel to the mirrors of the stage plate, and is invariant with respect to other translations or rotations of the stage plate so long as the mirrors remain in the optical path.

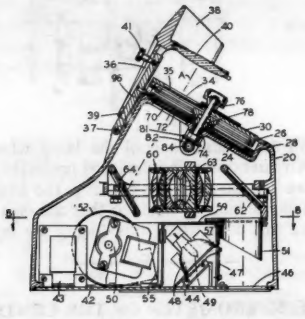
3,671,131
LITHOGRAPHIC COLOR ANALYZER USING INTERFERENCE MAGNIFICATION

Ralph C. Wicker, Fairport, N.Y., assignor to Chesley F. Carlson Company, Minneapolis, Minn.

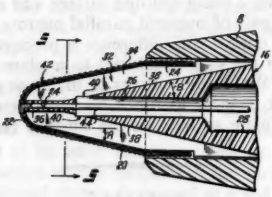
Filed Nov. 24, 1969, Ser. No. 879,016
Int. Cl. G01j *3/52*
U.S. Cl. 356—175 6 Claims

Lithographic color analyzer having a base with a viewing aperture and means for establishing a viewing plane

for a lithographic print or the like, a casing having an inclined deck, a pair of manually rotatable turret disks pivotally mounted on the deck, one having four dark half tone screens rotatably mounted therein and of different periodicity and a density as great as 99½%, and the other having color filter disks, a lens system having a 1 to 1 ratio within the casing on a substantially horizontal axis, a reflector above the aperture and in alignment with and on one side of the lens system, and a second reflector below the deck in alignment with and on the other side of the lens system, the reflectors and lens system being disposed on an optical axis extending normal to the viewing plane and normal to the plane of said half tone screen with the optical distance between the viewing plane and the optical center of the lens system being the same as the optical distance from the lens system center to the half tone screen plane, illumination for the viewing plane, forced air circulation for cooling the casing and establishing an above atmospheric pressure therein, a viewing lens disposed above the deck and the dark screen plane, means for manually rotating the half tone screens relative to the turret in which they are mounted, and a dial indicator above the deck for indicating the angle of rotation of the half tone screen.

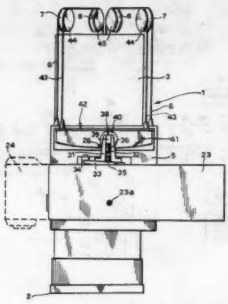


3,671,132
APPLICATOR WICK FOR A WRITING INSTRUMENT
Frederick R. Wittnebert, Whitewater, Wis., assignor to The Parker Pen Company, Janesville, Wis.
Filed Nov. 30, 1970, Ser. No. 93,751
Int. Cl. B43k 5/02
U.S. Cl. 401—292 **13 Claims**



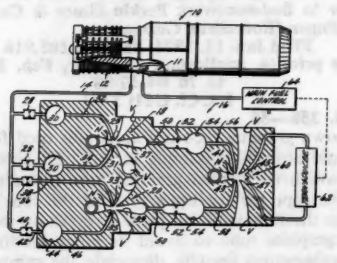
A self-cleaning writing point for a writing instrument, comprising a nib having a generally conical tip that terminates in a rounded apex, and about which is wrapped an applicator wick comprising a helix of fine resilient wire. The nib has feed channels therein for supplying ink to the applicator wick.

3,671,133
BALANCE COMPENSATED MACHINE TOOLS
Maso Galbarini, Pavia, and Francesco Cotta Ramusino, Milan, Italy, assignors to Innocenti Societa Generale per l'Industria Metallurgica e Meccanica, Milan, Italy
Filed Nov. 2, 1970, Ser. No. 86,050
Claims priority, application Italy, May 22, 1970, 68,759/70
Int. Cl. B23b 47/26
U.S. Cl. 408—235 **13 Claims**



A large machine tool having a bed, and an upright extending above the bed, the upright carrying vertical guideways for a slide which carries horizontal guideways for a workhead. The workhead is adapted to carry a range of different attachments. In order to relieve the guideways, as far as possible, from the weight of the slide, the workhead and its attachments, the slide is suspended, by a pulley system, from the top of the upright; a counterbalancing hydraulic actuator being provided on the far side of the upright; the workhead is mounted on an intermediate member which is suspended in the same way as the slide. The intermediate member carries a track along which the workhead can slide; the track is curved in a vertical plane to compensate for the extension of the cables as the workhead moves along the horizontal guideways of the slide. A cam and follower arrangement is provided to compensate for the shift in the centre of gravity as different attachments are connected to the workhead.

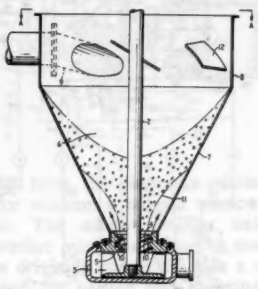
3,671,134
FLUIDIC SIGNAL DETECTION AND PREVENTION OF STALL IN COMPRESSORS FOR GAS TURBINE ENGINES
Willis A. Boothe, Scotia, N.Y., assignor to General Electric Company
Filed Sept. 27, 1967, Ser. No. 679,584
Int. Cl. F04d 27/02
U.S. Cl. 415—13 **9 Claims**



The disclosure shows fluidic means for detecting incipient stall of an axial flow compressor employed in a gas turbine engine. Fuel flow is modified as a result of such detection to move the operating point of the compressor away from a stall condition. Rapid fluctuations

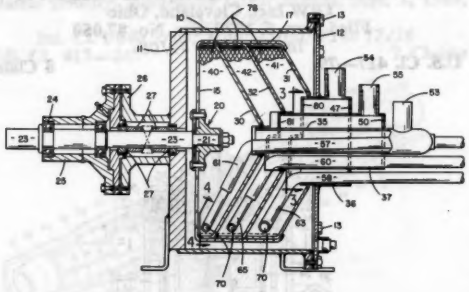
in the output pressure of the compressor, preferably in the range of 250 to 1,000 cycles per second, actuate the fluidic system to cause the change in fuel flow.

3,671,135
FROTH PUMP
Charles Harold Warman, Castlecrag, New South Wales, Australia, assignor to Warman Equipment (International) Ltd., Belmont, Western Australia, Australia
Filed May 15, 1970, Ser. No. 37,583
Int. Cl. F04d *1/00, 9/00;* **B01d** *47/00*
U.S. Cl. 415—53 **7 Claims**



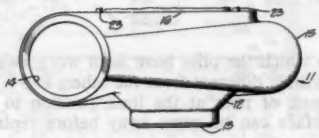
Centrifugal pumps having an impeller at the lower end of a vertical spindle, a casing surrounding the impeller, an intake opening through the upper wall of the casing and a feed chamber surrounding the spindle and communicating with the intake opening are modified, in order to handle frothy fluids by vaning the periphery of the opening in the casing so that part of the feed is returned to the feed chamber with increased energy causing a shearing vortex motion in the feed chamber.

3,671,136
MULTICOMPARTMENT PUMP STRUCTURE
Raymond D. O'Mara, Brewerton, and Charles K. Griffin, Auburn, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 30, 1970, Ser. No. 102,745
Int. Cl. F04d *1/14*
U.S. Cl. 415—89 **9 Claims**



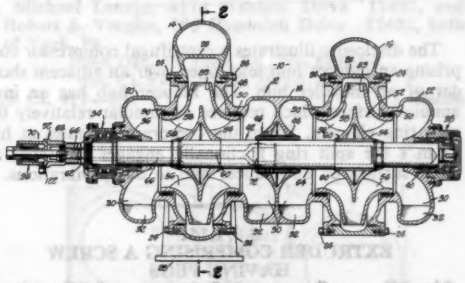
A cylindrical cup-shaped rotor is journaled in a closed casing and has a plurality of axially spaced-apart, frustoconical partition members forming fluid receiving compartments. An assemblage of inlet tubes is arranged in concentrically spaced relation about the axis of the rotor. The inlet tubes convey liquid to the rotor compartments respectively. A discharge tube is associated with each inlet tube and is formed with an inner end portion extending toward the periphery of the compartment supplied with liquid by the inlet tube with which the discharge tube is associated. The inner end portions of the discharge tubes incline in a direction from the axis of the rotor on an angle comparable to the partition members and have fluid pickup heads positioned contiguous to the periphery of the rotor compartments. The inner ends of the discharge tubes are arranged in a common plane.

3,671,137
CENTRIFUGAL PUMP WITH HYDROSTATIC BEARING
Rowland E. Ball, Long Beach, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed June 22, 1970, Ser. No. 48,369
Int. Cl. F04d *29/66, 7/00;* **B61f** *17/00*
U.S. Cl. 415—104 **7 Claims**



A vertical shaft, centrifugal pump has a steady bearing in the form of a radial hydrostatic bearing that journals the shaft, the hydrostatic bearing being energized by liquid circulated to it from the discharge zone of the pump impeller, the circulation of the bearing-energizing liquid being accomplished by an auxiliary centrifugal impeller driven by the shaft, the auxiliary impeller preferably being mounted on the main pump impeller.

3,671,138
COMPOSITE KNOCKDOWN PUMP
Rowland E. Ball, Long Beach, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Feb. 2, 1971, Ser. No. 111,962
Int. Cl. F01d *11/00*
U.S. Cl. 415—111 **21 Claims**

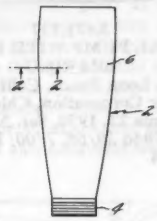


A centrifugal fluid pump suitable for assembly into an operable unit within a confined space including a plurality of impellers each mounted within respective fluid discharge members and in respective association with a plurality of fluid suction inlet members; such impellers being mounted on a composite drive shaft having a plurality of members integrally assembled to provide a high degree of radial and axial alignment and a high torque transfer capability.

3,671,139
COMPOSITE BLADE CONSTRUCTION
James S. Plowman, Longmeadow, Mass., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Sept. 11, 1970, Ser. No. 71,531
Int. Cl. F01d *5/28*
U.S. Cl. 416—61 **5 Claims**

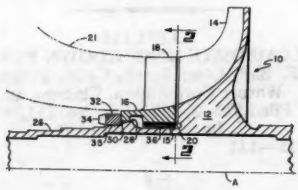
A fan blade or compressor blade is made up of a plurality of very thin plies of fibers for maximum

strength and these fibers are subject to damage by foreign objects that may engage the blades specially along its leading edge and thereby weaken the blade. To permit visual inspection of a blade to determine the



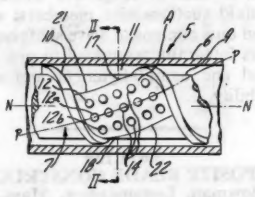
extent to which the plies have been worn away, one ply is made visibly different from the others and is positioned in the stack of plies at the limit position to which the blade surface can be worn away before replacement.

3,671,140
DAMPED TURBOMACHINE ROTOR ASSEMBLY
Wayne C. Shank, Williamsport, Pa., assignor to Avco Corporation, Williamsport, Pa.
Filed Oct. 5, 1970, Ser. No. 77,969
Int Cl. F01d 25/28
U.S. Cl. 416—183 **3 Claims**



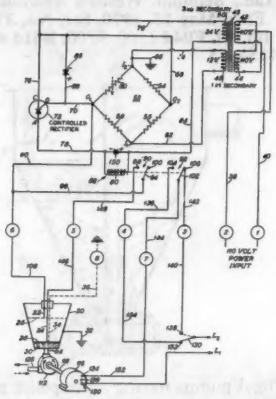
The disclosure illustrates a centrifugal compressor comprising an inducer hub telescoped over an adjacent shoulder of an impeller hub. The inducer hub has an inner annular surface which receives an annular relatively thin split ring element. When the compressor rotates at high r.p.m.'s the split ring frictionally engages the inner annular surface of the inducer hub to damp vibrations.

3,671,141
EXTRUDER COMPRISING A SCREW HAVING PEGS
Lloyd Kovacs, Somerset, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Jan. 8, 1971, Ser. No. 105,011
Int. Cl. B29f 3/02
U.S. Cl 416—176 **2 Claims**



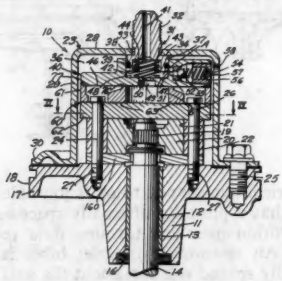
A specially constructed screw for an extruder of potentially plasticizable materials, e.g., so-called thermoplastic resins, which comprises radially-aligned pegs based in a non-eccentric undercut channel area of the screw core.

3,671,142
LIQUID LEVEL CONTROL
Ronald V. Calabrese, Forest Park, Ill., assignor to Lumenite Electronic Company, Franklin Park, Ill.
Filed June 22, 1970, Ser. No. 48,270
Int. Cl. F04b 49/06
U.S. Cl. 417—36 **11 Claims**



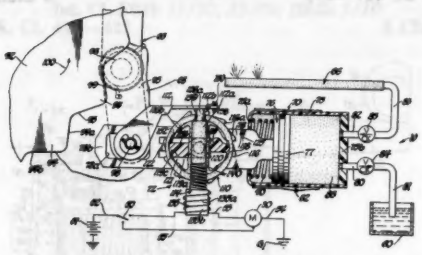
Liquid level control or indicator circuit in which a resistance bridge is unbalanced by change of liquid level in a container. Bridge is normally slightly unbalanced, and the degree of this slight unbalance may be variable to change the sensitivity. Change in liquid level significantly unbalances the bridge to bias a controlled rectifier, thereby triggering energization of a pump, valve, or signal or indicator device.

3,671,143
FLAT SIDE VALVE FOR PRESSURE BALANCED POWER STEERING PUMP WITH IMPROVED ASPIRATOR ACTION
Hubert M. Clark, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio
Filed Nov. 5, 1970, Ser. No. 87,050
Int. Cl. F04b 49/08
U.S. Cl. 417—79 **8 Claims**



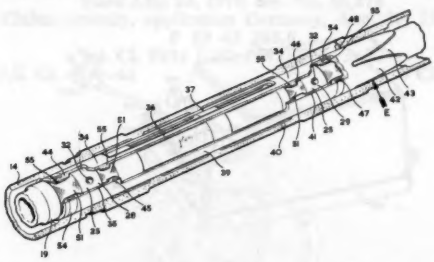
Pump bypass is channeled into an annulus and thence into a single flow passage constructed to obtain maximum aspiration at an oil makeup port so as to obtain maximum inlet supercharge.

3,671,144
TAILGATE WINDOW WASHER MECHANISM
Lloyd L. Kuck, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 23, 1970, Ser. No. 91,813
Int. Cl. F04b 17/06
U.S. Cl. 417—231 4 Claims



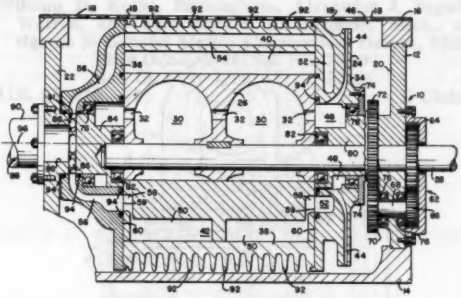
In a preferred form, this disclosure relates to a window washer unit for washing a tailgate window of a station wagon vehicle. The window washer unit includes a reciprocable washer pump, an actuating means including a drive means drivingly connected with a window regulator mechanism for raising and lowering the tailgate window and which has an interruptible driving connection with the reciprocable pump, and a control mechanism which is operable to establish a driving connection between the drive means and the reciprocable pump in response to the window regulator mechanism being actuated to raise the window and for interrupting the driving connection therebetween just prior to the window reaching its closed position and when the window is being lowered whereby the washer pump is only actuated to squirt washer fluid against the window when the latter is being raised from its open position towards its closed position.

3,671,145
IMPROVEMENTS IN OR RELATING TO BEARINGS
Frederick William Walton Morley, Derby, and Wilfred Thomas Watts, Edgware, England, assignors to Rolls-Royce Limited, Derby, England
Filed Aug. 18, 1970, Ser. No. 64,789
Claims priority, application Great Britain, Sept. 2, 1969, 43,325/69
Int. Cl. F04b 3/00, 5/00, 25/00; F16c 17/16
U.S. Cl. 417—247 7 Claims



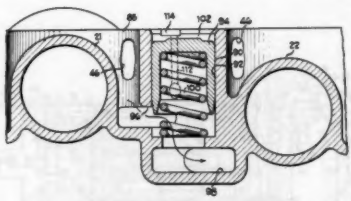
An inter-shaft bearing assembly for a multi-shaft gas turbine engine comprising a coaxial arrangement of an inner shaft mounted within a hollow outer shaft for relative rotation between the shafts with a sleeve disposed between the shafts and drivingly engaged by the outer shaft. The sleeve has a bearing surface which co-operates with a bearing surface on the inner shaft. Two annular projections on the sleeve disposed one each side of the bearing surface project radially inwardly thereof so that in operation oil which is supplied to the bearing surfaces is retained on the surfaces by the projections.

3,671,146
FLUID ENERGY MACHINE
William T. Alderson, W. Main St., Brookside, N.J. 07926
Filed Feb. 10, 1971, Ser. No. 114,128
Int. Cl. F01c 1/00; F03c 3/100; F04c 17/00
U.S. Cl. 417—243 21 Claims



A gas compressor, of the sliding vane-type, having at least one vane slidably mounted in a rotor. The rotor, is rotatable within a rotary cylinder on an axis offset from the cylinder axis. The cylinder and rotor are in synchronism, that is, they rotate at the same angular velocity, and the vane is slidably movable therebetween. The vane is channeled, and cooperates with inlet and outlet cylinder ports for admission and discharge of the gas being compressed.

3,671,147
HERMETIC COMPRESSOR
F. Michael Laucks, 4178 Wilshire Drive 17402, and Robert S. Vaughn, 395 Randolph Drive 17403, both of York, Pa.
Filed Dec. 30, 1969, Ser. No. 889,104
Int. Cl. F04b 17/00, 39/06, 49/00
U.S. Cl. 417—286 3 Claims



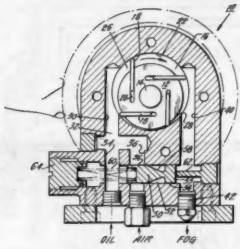
A multi-cylinder hermetic compressor with means for varying its capacity by positively closing off the flow of suction gas from the low side of the system to one or more cylinders. The suction gas is normally delivered to a chamber which supplies at least one cylinder at all times. The gas then flows through a passage to another chamber supplying a second cylinder or group of cylinders. A fluid operated capacity control valve is arranged in this passage to positively shut off flow to the second chamber to prevent gas from being supplied to cylinders receiving gas from the second chamber. The capacity control valve is operated by high pressure discharge gas, the flow of which is controlled by an internally mounted solenoid valve located in a line between the capacity control valve and a source of discharge gas within the compressor.

3,671,148

PUMP PRIMING AND FLOW CONTROL VALVE FOR PUMPING TWO DIFFERENT FLUIDS

Paul H. Reeve, River Vale, N.J., assignor to Auto Research Corporation, Boonton, N.J.

Filed Jan. 27, 1971, Ser. No. 110,024
Int. Cl. F04b 49/08
U.S. Cl. 417—295 13 Claims



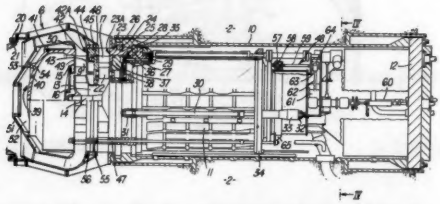
In a pump for pumping fluids of differing viscosities, a valve element which is shiftable to both block and regulate the flow of the fluid of lower viscosity; the valve normally blocks the flow of lower viscosity fluid until the pump is primed; outlet pressure from the pump, which is developed only when the pump is primed, moves the valve away from the blocking position, against a biasing means, to open the conduit of lower viscosity fluid; the biasing means controls the extent to which the valve is opened, and thereby regulates the ratio of low viscosity to high viscosity fluid that is pumped.

3,671,149

COOLING-GAS CIRCULATORS FOR NUCLEAR-POWER STATIONS

William Milton Fraser, Busby, Glasgow, Walter John Cairns, Bearsden, Glasgow, and Ian Norman McDonald, Largs, Scotland, assignors to James Howden & Company Limited, Glasgow, Scotland

Filed Oct. 9, 1968, Ser. No. 766,211
Int. Cl. F04d 25/06
U.S. Cl. 417—360 7 Claims



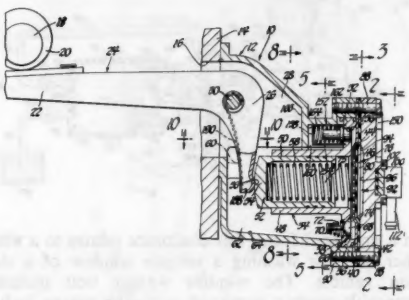
A circulator for the pressurized gas in the cooling circuit of a nuclear reactor power station is of a kind having an electric motor withdrawably mounted in a wall-mounted pressure vessel, and a motor-driven gas blower in the gas space at the inner end of the vessel. Provision is made for isolating the inner end of the vessel from the reactor to enable withdrawal of the blower with the motor, the isolating means including an axially reciprocable ring closing an annular gap between the blower casing and ducting in the gas space, and an axially reciprocable dome in the gas space; the ring engaging the vessel and the dome engaging the ring to effect sealing of the vessel from the reactor.

3,671,150

ENGINE CAM OPERATED AIR COMPRESSOR FOR VEHICLE LEVELING SYSTEM

George W. Jackson and James E. Whelan, Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 21, 1970, Ser. No. 73,845
Int. Cl. F04b 43/06, 45/00; F15b 7/00
U.S. Cl. 417—395 6 Claims



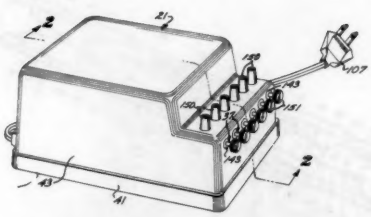
In preferred form, a compressor having an open ended housing adapted to be connected to a cam port on an engine block. An operating arm is driven by an engine cam to reciprocate a piston within an oil filled cylinder which includes an intake valve to a sump in the housing and a relief valve for flow of excessive oil from the cylinder back to the sump. A pump diaphragm is operated by reciprocation of the piston in the cylinder to draw air into and discharge air from an air pumping chamber which includes a plurality of shallow, narrow relief passageways therein to reduce re-expansion of compressed air in the chamber. An improved oil baffling arrangement prevents aeration on the oil side of the diaphragm.

3,671,151

COMBINATION AQUARIUM PUMP AND GANG VALVE

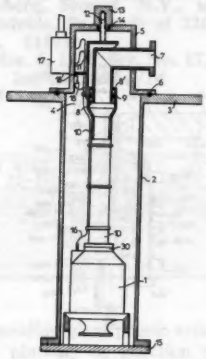
Bernard Duke, Deal, N.J., and David Z. Levensohn, New York, N.Y., assignors to Miracle Pet Products, Inc., Jersey City, N.J.

Filed May 11, 1970, Ser. No. 35,988
Int. Cl. F04b 17/00, 35/04; F10i 11/00; F16k 31/44
U.S. Cl. 417—411 4 Claims



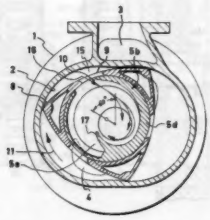
A housing having a pump mounted therein and including a valve manifold having an inlet chamber with a plurality of stem-receiving bores in communication therewith, and outlet ports extending transversely thereof. The bores are formed with valve seats interposed between the inlet chamber and respective outlet ports and include threaded sections. Valve stems are inserted in the respective bores and are threaded for engagement with said threaded sections whereby the combination pump and valve may be installed as a unit to provide air at selected flow rates from the respective outlet ports.

3,671,152
ELECTRIC PUMP ASSEMBLY FOR USE IN PUMPING EXPLOSIVE OR DANGEROUS LIQUIDS
Paul Andre Guinard, Saint Cloud, France, assignor to Etablissements Pompes Guinard, Saint Cloud, France
Filed Feb. 10, 1970, Ser. No. 10,258
Claims priority, application France, Feb. 20, 1969, 69,044
Int. Cl. F04b *17/00, 35/04;* H02k *5/10*
U.S. Cl. 417—422 3 Claims



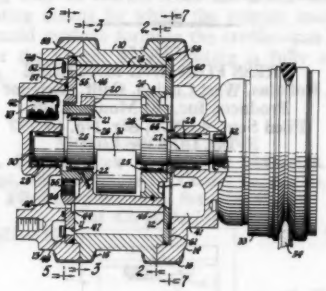
This invention relates to an electric pump assembly for use in pumping explosive or dangerous liquids in containers, the assembly comprising a fluid tight container, an electric pump mounted within said cointainer, a pump liquid inlet within the container, and a pump liquid outlet, the pump comprising an electric pump motor, said electric pump motor including a winding for submerging in a liquid in the container, said winding comprising at least one wire, a covering insulating said wire, which covering resists the liquid, sealing means through which said wire extends without discontinuity to the exterior of the container, and electric power input terminals on said wire.

3,671,153
ROTARY PISTON COMPRESSOR
Friedrich Luck, Berlin, Germany, assignor to Firma Wankel GmbH, Lindau, and Firma Borsig GmbH, Berlin-Tegel, Germany
Filed Aug. 24, 1970, Ser. No. 66,278
Claims priority, application Germany, Aug. 26, 1969, P 19 43 338.6
Int. Cl. F01c *1/02, 1/42;* F03c *3/00*
U.S. Cl. 418—61 4 Claims



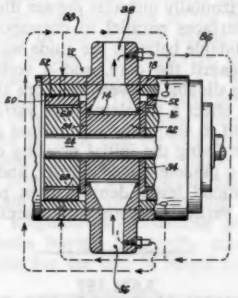
A circular piston compressor having a stationary housing with a trochoidal inner boundary and a rotary piston mounted on the eccentric of a shaft so that its axial centerline describes a circular path during its rotation. Inlet apertures are provided in the end walls or cover of the housing or both for entry of the working medium and outlet apertures are provided in the flanks of the piston. A passage adapted to communicate with the outlet aperture occupies virtually the inside diameter of the eccentric and diminishes spirally in the pin towards the outlet for outlet of the compressed medium.

3,671,154
EPITROCHOIDAL COMPRESSOR
William H. Kolbe, Birmingham, Alexander J. Sagady, Warren, and Taro Suzuki, Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 8, 1970, Ser. No. 79,194
Int. Cl. F01c *1/02, 17/02, 19/08*
U.S. Cl. 418—61 6 Claims



A compressor of the epitrochoidal rotor type has a rotor with N hollow lobes and a stator housing with $N+1$ lobes, a common discharge and inlet side plate on one side of the rotor and an inlet side plate on the opposite side of the rotor loaded against the rotor by fluid pressure led from the discharge cavity of the compressor.

3,671,155
HYDROSTATIC BEARING
Terence N. Dubinsky, Racine, Wis., assignor to J. I. Case Company
Filed Apr. 13, 1970, Ser. No. 27,472
Int. Cl. F01c *21/04;* F16c *13/02, 33/66*
U.S. Cl. 418—73 4 Claims

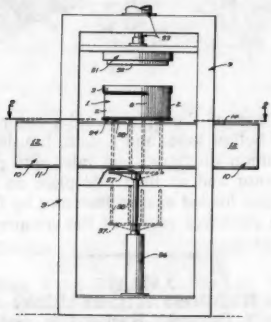


The present disclosure relates to an apparatus for supporting a rotating element relative to a housing of a fluid translating device by primary and secondary bearing means.

The secondary bearing means includes first and second sleeves surrounding the rotor supporting shaft with each of the sleeves having a plurality of outer recesses cooperating with the housing to produce pockets or chambers and a plurality of inner recesses cooperating with

the shaft to produce inner pockets or chambers. Each outer pocket receives diverted pressured fluid from the port which is in opposed relationship on the rotor or shaft and the outer pocket communicates with the inner pocket to direct this fluid into the area between the shaft and the bearing sleeve. The internal surface of the sleeve has two opposed circular segments having equal radii with the centers of the segments spaced from each other with the radii being substantially equal to the diameter of the shaft. The inner pockets are divided into first and second axially spaced portions so that any axial misalignment between the sleeves and the bearing will increase the flow path between the bearing and the shaft along one edge of the sleeve and decrease the flow path along the opposite edge to produce a pressure differential thereby automatically aligning the sleeve and shaft.

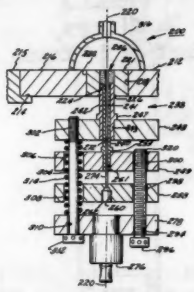
3,671,156
PRESS FORMING MACHINE
James L. Robbins, West Covina, Calif., assignor to Brooks Products, Inc., El Monte, Calif.
Filed Sept. 4, 1970, Ser. No. 69,797
Int. Cl. B29c *1/00*
U.S. Cl. 425—130 **5 Claims**



A machine and method of press forming an initially flocculent cementitious mixture to produce a rectangular, round or other shaped open boxlike product such as a meter housing, the machine including a core mounted between guide walls in angular relation therewith, a pair of opposed horizontally movable presser dies having angularly related surfaces parallel to corresponding sides of the core and slidable between the guide walls to compress the mixture against the core, and a vertically movable presser die ring slidable between the core and the opposed presser dies to effect a supplementary vertical pressing of the mixture and to shape the top portion of the product; the method involving the initial pressing of a portion of the product to a predetermined density, and the remainder to a predetermined lesser density, then pressing the remainder in a vertical direction to essentially the same density.

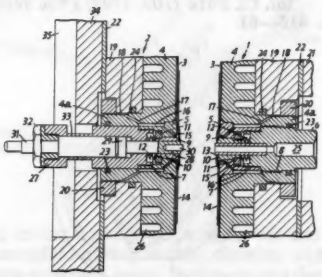
3,671,157
DIE AND PUNCH ASSEMBLY FOR COMPACTING POWDER MATERIAL
Joseph E. Smith, Birmingham, Mich., assignor to Wolverine-Pentronix, Inc., Lincoln Park, Mich.
Continuation-in-part of applications Ser. No. 782,918, Dec. 11, 1968, now Patent No. 3,593,366, and Ser. No. 49,800, June 25, 1970. This application Jan. 25, 1971, Ser. No. 109,375
Int. Cl. B30b *11/02*
U.S. Cl. 425—78 **14 Claims**

A die and punch assembly for use on a powder compacting press for making articles compacted from a powder material. The assembly comprises a die plate appropriately mounted to the press and includes one or more die cavities, each die cavity having telescopically arranged inner and outer punches adapted for movement relative to each other to form various shaped articles. The outer punch is actuated by a first punch support which, in turn, is carried by a pair of posts extending below the die plate to permit reciprocal movement of the outer punch within the die cavity, while the inner punch is carried by a second punch support which, in turn, is slidably carried by the post in a position below the first punch support. An



actuating stem, operatively connected to one of the punch supports, is adapted to impart a reciprocal movement thereto and includes an adjustable abutment member adapted to engage the other punch supports to displace the latter in an upward direction together with the first punch support as a unit after the actuating stem has moved the first punch support a predetermined distance toward the die cavity. The second punch support has an adjustable abutment member cooperating with the actuating stem to retract both punch supports as a unit away from the die cavity after an article has been compacted in the die cavity.

3,671,158
MOULDING OF GRAMOPHONE RECORDS
Walter Leslie Rand, Gerrards Cross, and John Ernest Simmons, Ruislip, England, assignors to EMI Limited, Hayes, Middlesex, England
Filed Mar. 26, 1970, Ser. No. 22,952
Claims priority, application Great Britain, Mar. 26, 1969, 15,700/69
Int. Cl. B29d *17/00*
U.S. Cl. 425—129 **9 Claims**



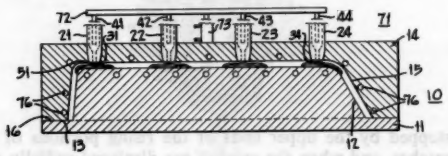
Gramophone records are moulded by a combined injection-compression process. Mouldable material is injected into the mould prior to final closing of the mould. The tip of the injection nozzle extends into the mould cavity and when the final closing of the mould occurs, a counterpiece and the nozzle tip close together intermediate the record surfaces to form the centre hole in the

record. A poppet valve in the centre region of each mould part is open prior to the injection step and a record label is held at the centre of each mould part by suction applied to the valve opening. The pressure of the injected material is sufficient to close the valves which are spring biased to their open positions.

3,671,159
EJECTING GIANT ARTICLES FROM INJECTION MOLD

Walter H. Greenberg, Syosset, N.Y., and Walter D. Voelker, Philadelphia, Pa. (both of 220 Miller Road, Hicksville, N.Y. 11801)

Filed Mar. 6, 1970, Ser. No. 17,253
Int. Cl. B29f *1/14*
U.S. Cl. 425—155 **1 Claim**

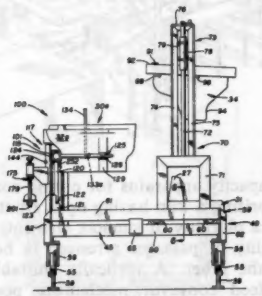


Apparatus for molding giant plastic articles of cellular plastic includes a plurality of injection nozzles having plungers which are generally kept at their advanced position with the plunger tips at the nozzle tips. After the article is adequately cooled by the cold liquid in heat transfer conduits, a timing means controls an actuating means to shift a plurality of the plungers of the nozzles to a super-advanced position, thereby knocking out the giant article from the fixed portion of the mold. Compressed gas jets from adjacent the tips of the plungers desirably accelerate the enlargement of the separation zones for deadhering the giant article from the fixed portion of the mold.

3,671,160
APPARATUS FOR A SYSTEM TO EXTRICATE INTRICATE, CERAMIC SHAPES FROM MULTIPLE PIECE MOLDS

Fred L. Derror, Lucas, Ohio, assignor to Mansfield Sanitary, Inc., Perrysville, Ohio

Filed Oct. 13, 1969, Ser. No. 865,863
Int. Cl. B28b *21/08*
U.S. Cl. 425—161 **12 Claims**

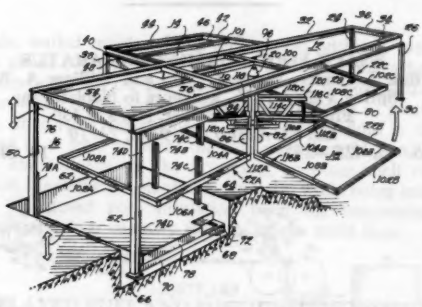


Apparatus for extricating an intricate ceramic casting from a multiple piece mold. This concept is adapted for use with multiple piece molds which have at least two, opposed, side sections that form a cradle by which the casting may be supported. The cradle is grasped and subsequently positioned at a receiving locus. So positioned, the support for the weight of the casting is shifted from the cradle onto a bat in order that the casting will float within the cradle. Thereafter, the sections of the mold forming the cradle are separated to extricate the casting therefrom. For some ceramic shapes it is highly desirable to invert the cradle prior to the deposit of the casting at the receiving locus. The subject concept includes such a method step. The apparatus disclosed comprises a carriage on which a plurality of multiple piece molds may be supported, means to separate the cradle from any other sections of the mold, an inversion mechanism for turning the cradle upside down, gripper means to grasp the cradle, transfer means within which the gripper means is supported and by which the cradle can be moved from the inversion mechanism to a receiving locus, a lift means at the receiving locus by which the support for the weight of the casting may be shifted from the cradle onto a bat and actuating means by which the gripper means—and thus the mold sections forming the cradle—can be separated after the weight of the casting is fully supported on the bat.

3,671,161
MOLDING MACHINE

Robert E. Kostur, Oak Brook, and Robert J. Brown, Chicago, Ill., assignors to Comet Industries, Inc.

Filed May 26, 1970, Ser. No. 40,568
Int Cl. B29c *1/00*
U.S. Cl. 425—195 **7 Claims**



To reduce the vibrating of the molding machine during a molding operation, the frame of the molding machine includes two parallel I beams extending across the top of the machine from the outer end of the molding station to the outer end of the loading station with a rotary drive shaft and plastic sheet carrying assembly being centrally mounted with respect to the I beams for easy assembly and replacement. The rectangular sheet-holding frames of the rotary sheet carrying assembly are vertically supported at each end by turnbuckles connected to trusses by which the horizontal angle of the frames is adjusted. To permit easy assembly of the dies to movable platens within the molding station, the movable platens include longitudinally extending grooves adapted to receive T-bolts having outwardly extending shanks whereby the base for the dies is bolted to the platen.

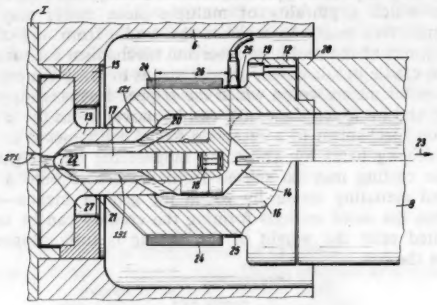
3,671,162
NOZZLE CONSTRUCTION FOR INJECTION MOLDING MACHINES

Albert Lohmann, Niederkruchten, Germany, assignor to Mannesmann-Meer Aktiengesellschaft, Monchen-Gladbach, Germany

Filed Apr. 26, 1971, Ser. No. 137,583
Int. Cl. B29f *1/03*
U.S. Cl. 425—245 **2 Claims**

An injection molding machine with two molds are filled in tandem operation by a common injection unit

with a distributor and two nozzles. These nozzles are constructed in that tubular nozzle torpedoes extend from each mold sprue and are telescopically received by heads on the distributor, opening and closing channels in the nozzle torpedoes in dependence upon the position of the



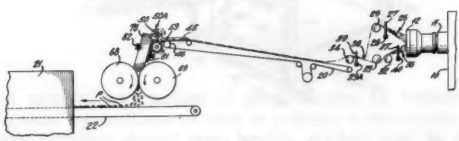
injection unit between the two molds. Spring biased stopper pins in the torpedoes open and close the sprues in dependence upon pressure within the torpedoes. That pressure develops in dependence upon channel opening and closing.

3,671,163

SNACK FOOD FORMING APPARATUS

Arthur J. Griner, Wyckoff, N.J., and William A. Blain, Spring Valley, N.Y., assignors to Nabisco, Inc.

Filed June 2, 1969, Ser. No. 829,430
Int. Cl. A21c *7/06, 9/02, 11/10*
U.S. Cl. 425—297 **10 Claims**



An apparatus in which a high pressure housing holds a pre-cooked potato or other vegetable mixture such as corn to be extruded as a plurality of dough strands therefrom through a die plate having a multiplicity of openings in such arrangement that emerging dough strands in upper and lower groups may be integrated for parallel feeding through cutting means and subsequently fed to flaking rolls so that parallel strands of the dough after cutting will form dough pieces otherwise known as collets or puffable half products.

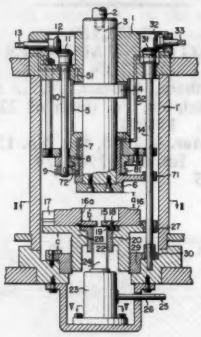
3,671,164

CORE ROD STOPPING AND RELEASING DEVICE IN A POWDER MATERIAL FORMING PRESS

Ei Hara and Shohachi Suzuki, Tokyo, Japan, assignors to Tamagawa Kikai Kinzoku Kabushiki Kaisha, Tokyo-to, Japan

Filed July 23, 1970, Ser. No. 57,695
Claims priority, application Japan, Sept. 29, 1969, 44/77,304
Int. Cl. B30b *11/02, 15/00*
U.S. Cl. 425—414 **4 Claims**

A stopping and releasing device for a core rod employed in a powder material forming press whenever an article having a stepped hole is produced from a powder material comprises a plurality of radially displaceable catches each having a radially inwardly extended tongue-like portion and a radially outwardly located rising portion of a predetermined height. Means are provided for displacing the plurality of catches radially inwardly or outwardly, whereby when the plurality of catches are displaced radially inwardly, the core rod is



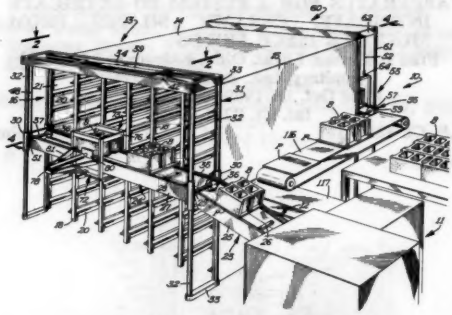
stopped by the upper ends of the rising portions of the catches, and when the catches are displaced radially outwardly, the core rod is released for a predetermined distance until it is supported by the radially inwardly extended tongue-like portions of the catches.

3,671,165

APPARATUS FOR MAKING CONCRETE BLOCKS

Donald D. Schwellenbach, 124 S. Filmore, Pierre, S. Dak. 57501

Continuation-in-part of application Ser. No. 646,373, June 15, 1967. This application Aug. 28, 1969, Ser. No. 853,914
The portion of the term of the patent subsequent to Feb. 3, 1987, has been disclaimed
Int. Cl. F27b *3/18*
U.S. Cl. 425—445 **4 Claims**



A high capacity apparatus for curing concrete building blocks comprising a kiln having open front and rear ends and having a plurality of support elements therein to define a plurality of passages arranged in horizontal rows, one above the other. A vertically shiftable horizontally oriented infeed conveyor mechanism positioned transversely of and closely adjacent the front end of the kiln for conveying uncured blocks to the kiln, and a vertically shiftable horizontally oriented removal conveyor mechanism positioned transversely of and closely adjacent the rear end of the kiln for receiving cured blocks from the kiln. Means for simultaneously shifting the conveyor mechanisms vertically and a block shifting mechanism carried by the infeed conveyor mechanism for successively feeding uncured blocks, one at a time into the passages.

3,671,166

FLASHBULB WITH PERCUSSION IGNITION AND PRE-FORMED IGNITION TUBE

Werner Schilling, Heidenheim, and Wolfgang Ott, Augsburg, Germany, assignors to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munich, Germany

Filed July 30, 1970, Ser. No. 59,517
Claims priority, application Germany, July 31, 1969, P 19 39 085.3
Int. Cl. F21k 5/02
U.S. Cl. 431—93 11 Claims

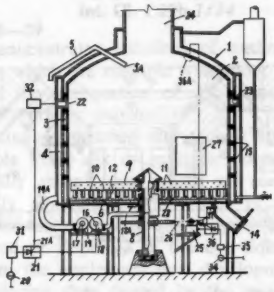
An ignition tube with one end sealed into a flashbulb and its other end projecting externally of the bulb is filled with flash material (such as shredded zirconium foil). The end of the ignition tube projecting externally of the bulb is pre-formed in a specified region and shaped to have a rectangular or similar cross-section so that it has one long and one short cross sectional dimension, to avoid the necessity of substantial deformation upon being struck an ignition blow; the percussive type ignition material is located, at least partly, in the deformed region, preferably encapsulated as a separate structural element.

3,671,167

INCINERATOR FOR WASTE OIL AND THE LIKE

Satoru Nakano, Ootsushi, Japan, assignor to Iwatani & Co., Ltd., Osaka, Japan

Filed Jan. 15, 1971, Ser. No. 106,743
Claims priority, application Japan, June 12, 1970, 45/51,131, 45/51,132
Int. Cl. F23l 9/00
U.S. Cl. 431—190 11 Claims



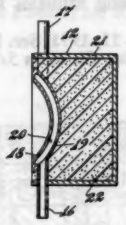
This invention provides an incinerator adapted to dispose of waste products containing water and earth, which are otherwise difficult to completely burn, in which the substance is atomized by a jet of primary air, and burned in an admixture with secondary and tertiary air, under automatic control of the air supply, and includes stirring of the substance by rotating vanes in accordance with its burning condition.

3,671,168

LOW HEAT CAPACITY MOLD FOR INJECTION MOLDING

Frank J. Nussbaum, New York, N.Y., assignor to Bischoff Chemical Corporation, Hicksville, N.Y.

Continuation of abandoned application Ser. No. 752,518, Aug. 14, 1968. This application June 9, 1971, Ser. No. 149,901
Int. Cl. B29c 1/00
U.S. Cl. 425—242 1 Claim



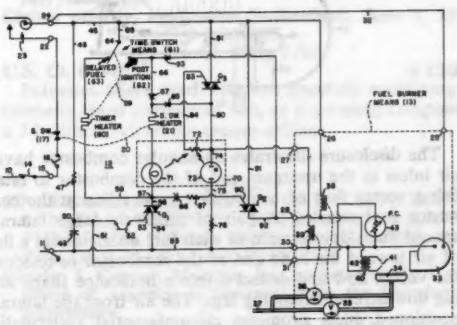
Thin walled molds having a thickness within a range from about 0.4 mm. to about 4 mm. and having a heat capacity less than the heat capacity of the molded article are provided in apparatus for injection molding of plastic foam. In certain embodiments, heat transfer fluid is circulated in a zone adjacent the thin walled mold face. In some embodiments of the invention, an outer shell can provide supplemental structural strength, while being insulated by closed pore insulation from the temperature changes and heat capacity features of the mold face.

3,671,169

DELAYED FUEL AND POST IGNITION TIMED BURNER CONTROL SYSTEM

Roland L. Hron, Bloomington, Minn., and Franciscus A. Jannink, Sleen, Netherlands, assignors to Honeywell Inc., Minneapolis, Minn.

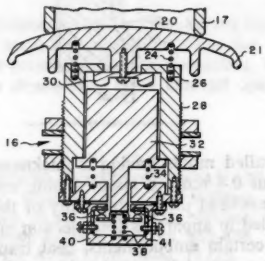
Filed Mar. 15, 1971, Ser. No. 124,129
Int. Cl. F23n 5/20
U.S. Cl. 431—67 8 Claims



A substantially all solid state control system which is adapted to be connected to control a fuel burner means

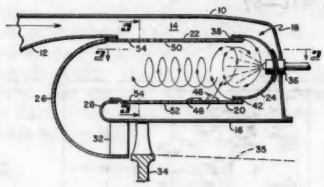
is disclosed and provides a delayed fuel and post-ignition timing period using a heater operated bimetal switch. The system is adapted to be energized through a line voltage thermostat to provide power to a fuel burner means which may include two stages of fuel control, along with an ignition means and flame detection means. The system includes a diode connected between a Triac, which controls the first stage of fuel, and the safety switch heater that is normally contained in such a system. This diode provides a safe mode of failure in the event the Triac short circuits and also provides a current path for safety switch heater current in the event of a flame failure during normal operation.

3,671,170
SAFETY CONTROL
James A. Sink, Jr., and Richard J. Watson, Taylors, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed Jan. 11, 1971, Ser. No. 105,407
Int. Cl. F23n *5/24*
U.S. Cl. 431—88 **4 Claims**



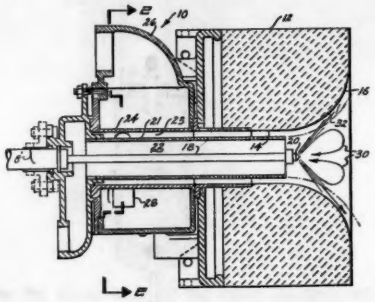
Improved method and apparatus to cut off the fuel supply to a liquid or gas fired heater if such heater is dislodged in any manner from the position where it is installed.

3,671,171
ANNULAR COMBUSTORS
Brian W. Doyle, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Nov. 27, 1970, Ser. No. 93,120
Int. Cl. F23l *1/00, 9/00*
U.S. Cl. 431—116 **5 Claims**



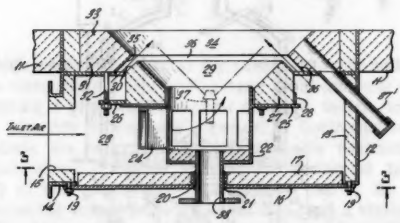
The disclosure illustrates an annular combustor having air inlets in the upstream end of the combustor to establish a vortex flow of combustion gases adjacent the combustor fuel nozzles. A pair of relatively large laterally spaced ducts downstream of each fuel nozzle direct a flow of air toward the head end of the combustor to reinforce the vortex flow and deflect it into a horseshoe shape having downstream extending legs. The air from the laterally positioned ducts promotes circumferential recirculation near the fuel nozzles to stabilize combustion. A pair of relatively smaller downstream ducts provide streams of air that stabilize the downstream extending legs of the vortex flow.

3,671,172
MULTIFUEL BURNER
Jacques Chedaille and Gerben Koopmans, Paris, France, assignors to Midland-Ross Corporation, Toledo, Ohio
Filed Mar. 30, 1970, Ser. No. 24,644
Claims priority, application France, Mar. 28, 1969, 6908209
Int Cl. F23c *4/00*
U.S. Cl. 431—174 **3 Claims**



A burner capable of operating on a gaseous and a liquid fuel separately and in combination with each other to produce a flame which has a greater extent in lateral directions than in an axial direction. A flared tunnel extends through a refractory wall and has its axis normal to the inner planar surface of the wall. The flared section of the tunnel is symmetrical in lateral planes and is smoothly contoured into the inner planar surface of the wall. A conical stream of liquid fuel particles is injected into the small end of the flared section so that its conical angle is substantially tangent to the surface of the midsection of the flared section. Surrounding the liquid fuel supply tube is a gaseous supply tube for supplying an annular column of gaseous fuel to the entrance of the flared section. Means are provided for supplying a helically swirling annular column of combustion air adjacent the tunnel surface around the fuel stream or streams.

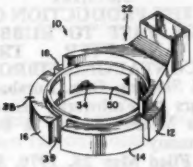
3,671,173
CHAMBERLESS HIGH INTENSITY BURNER EMPLOYING AUXILIARY AIR FLOW
Robert P. Guerre, Dover, and Ross R. Ruland, Hopatcong, N.J., assignors to Esso Research and Engineering Company
Filed July 6, 1970, Ser. No. 52,341
Int. Cl. F23m *9/08*
U.S. Cl. 431—182 **15 Claims**



A chamberless, high intensity burner especially suited for the incineration and combustion of contaminated fuels and waste streams by achieving a high, concentrated degree of mixing and, therefore, a high temperature, in a relatively small but structurally unconfined volume. The

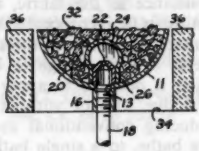
device utilizes the principal of vortex air flow from swirling air jets to achieve a high degree of recirculation local to the point of fuel injection, together with one or more coaxially-oriented annular-shaped streams of air to provide intimate mixing of fuel and air as well as to shape, control and contain the flame envelope. Utilizing the air required for combustion in this manner eliminates the need for a refractory-lined chamber which otherwise would be required to confine the combustion process in order to generate the extreme temperatures sometimes required for complete incineration. The burner is, of course, not limited to such applications, but offers particular advantage where contaminants are present in the fuel and which are incompatible with or otherwise destructive to mechanically formed combustion chambers.

3,671,174
DEEP FAT FRYER
Edward A. Reid, Jr., Columbus, Ohio, assignor to Columbia Gas System Service Corporation, New York, N.Y.
Filed Feb. 10, 1970, Ser. No. 10,126
Int. Cl. F23d *13/14*
U.S. Cl. 431—326 **8 Claims**



A deep fat frying unit having a glass cooking vessel adapted to hold a supply of cooking oil. The unit is heated by an annular infrared radiant gas burner assembly which heats the oil primarily by infrared radiation passing from the burner assembly directly through the vessel wall. The burner assembly is above the bottom of the vessel so that there is a cool zone at the bottom of the vessel which eliminates burning food sediment deposited therein. The radiant heat is absorbed by the oil in an annular zone adjacent the vessel wall and this produces oil circulation by convection upwardly along the wall and downwardly at the center of the vessel, but without overheating the oil.

3,671,175
FIREPLACE LOG BURNER
Billy G. Campbell, 617 N. Hobson, Shawnee, Okla. 74801
Filed Oct. 26, 1970, Ser. No. 84,006
Int. Cl. F24b *1/18*; F24c *3/04*
U.S. Cl. 431—328 **3 Claims**



An elongated trough-like body is centrally connected with a gas supply pipe in a fireplace area. A mandrel, secured to the inner surface of the trough in communication with the gas supply, supports a tubular gas distributor in the bottom portion of the trough and longitudinally coextensive therewith. The trough is filled with granular material for further distributing and burning the gas.

CHEMICAL

3,671,176
STABLE, HIGHLY CONCENTRATED DYE SOLUTION OF ANTHRAQUINONE DYES IN WATER MISCIBLE SOLVENTS
Otto Kaufmann, Ludwigshafen, Manfred Daeuble, Frankenthal, Heinz Guenter Witsch and Enno Luebcke, Ludwigshafen, and Dimiter Bayew, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Sept. 8, 1969, Ser. No. 856,185
Claims priority, application Germany, Sept. 12, 1968, P 17 94 132.1
Int. Cl. C09b *1/34*
U.S. Cl. 8—39 **4 Claims**

Stable concentrated solutions of anthraquinone dyes in solvents which are miscible with water and which are useful for the preparation of dye liquors for dyeing natural or synthetic polyamides.

For dyeing or printing nitrogenous fibrous material, for example wool, silk or snythetic polyamide fibers, it is principally anionic dyes which are used. These dyes are usually supplied in the form of finely ground powders, containing standardizing agents, which have to be dissolved or dispersed in the dye liquor for dyeing. Apart from the unpleasant dust development of the intensely coloring dyes caused by the powder form and the risk of agglomeration of the dye powder, it is by no means easy to dissolve or disperse the solid dye in the dye liquor because the dye usually has inadequate solubility in water.

3,671,177
AZO DYESTUFFS AND A PROCESS FOR DYEING OR PRINTING POLYESTER FIBERS WITH SUCH DYESTUFFS
Klaus Artz, Muttenz, Switzerland, Nalin Binduprasad Desai, Goregaon, Bombay, India, and Hans Wilhelm Liechti, Oberwil, Basel-Land, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland
No Drawing. Continuation-in-part of application Ser. No. 734,247, June 4, 1968. This application Aug. 7, 1970, Ser. No. 62,166
Claims priority, application Switzerland, June 7, 1967, 8,066/67
Int. Cl. D06p *1/02*
U.S. Cl. 8—41 C **4 Claims**

Polyester fibers dyed with azo dyestuffs containing an aromatic diazo component and, as a coupling component, a 3-hydrocarbylcarbonylamino-aniline.

3,671,178
SINGLE BATH PROCESS FOR ORANGE TO BROWN MINERAL DYEINGS, WITH AND WITHOUT FUNGICIDE, USING IRON, MANGANESE, AND ZIRCONIUM (ZIRC-OX PROCESS)
Charles J. Conner, Metairie, La., assignor to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed May 19, 1970, Ser. No. 38,900
Int. Cl. D06p *3/60*; A61l *13/00*
U.S. Cl. 8—52 **15 Claims**

Orange to brown mineral dyeings are conventionally prepared from two bath systems, where the fabric is

wetted with one bath containing an iron salt, and then wetted with another bath containing alkali, to cause the colored iron oxide to deposit in the fabric as a mineral dye. This has been necessary up to now, since it has been chemically incompatible to have the iron in the same alkaline bath with the alkali. This invention demonstrates that a heat decomposable complex of the iron, with or without manganese, can be compatible with alkaline zirconyl ammonium carbonate solutions in the same bath, when cellulosics can be wetted in this bath, and subsequently mineral dyed by heat curing, when the complex of iron decomposes to deposit iron oxide with zirconia, the zirconyl ammonium carbonate decomposing at the same time to deposit zirconia. When heptavalent manganese ($KMnO_4$) is incorporated into the bath with the complexed iron, it is soluble and compatible, producing manganese dioxide (MnO_2) by reduction products from the iron complex, resulting in various shades of orange to brown with the iron oxide and zirconia also deposited. This process makes it possible to deposit orange to brown wash-fast mineral dyeings from a single bath. The deposited zirconia attributes a degree of water repellency and algaecidal resistance to the fabric, and a copper or phenyl-mercury salt can be incorporated into the zirconyl ammonium carbonate component of the system to deposit a fungicidal mineral dye of orange to brown shade on heat curing, making it possible to apply an iron and/or manganese mineral dye with or without fungicide from a single bath, reducing conventional dyeing procedures from two or more baths, to a single bath requiring only a simple pad, dry, and cure procedure to effect the dyeing. The fabrics are not seriously tendered, and the residual by-product salts may or may not be removed by washing, since the fabric is not stiffened by their presence and the dyed colors are unaffected on standing.

3,671,179

BLEACHING PROCEDURE FOR FIBERGLASS FABRICS

Allen J. Jinnette, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

No Drawing. Filed Feb. 16, 1971, Ser. No. 115,760
Int. Cl. D06l *3/00*
U.S. Cl. 8—101 **6 Claims**

Fiberglass fabrics and other siliceous fiber fabrics in the greige condition are rendered clean and white prior to applying dye or finish by heat-treating the fabrics at a temperature sufficient to set crimp in the glass yarns, to volatilize volatile components of the sizing on the fabric and to dextrinize the starches in the sizing, then treating the fabric with a concentrated bleaching solution, drying at relatively high temperature, and washing and rinsing.

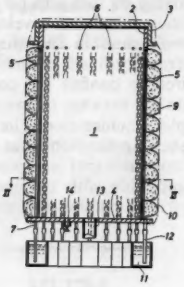
3,671,180

METHOD OF DYEING OR IMPREGNATING TEXTILES AND AN APPARATUS FOR CARRYING THE METHOD INTO EFFECT

Bent Koch, Kornagervej 81, Lyngby, Denmark

Filed Nov. 17, 1970, Ser. No. 90,334
Claims priority, application Denmark, Nov. 19, 1969, 6,129
Int. Cl. B05c *8/02*
U.S. Cl. 8—149 **7 Claims**

Textile material is placed in a container having a flexible wall portion and air is evacuated from the material which is compressed by the flexible wall portion simultaneously with impregnating or dyestuff liquid being sucked in and flows into the textile material from supply pipes which are connected with containers for dyestuff or impregnating liquid. Then the pressure difference between the outer and the inner side of the container is equalised during elastic expansion of the textile material. In this way blurred colours after completion



of the impregnation are avoided and the consumption of dyestuff liquid is very small.

3,671,181

PROCESS FOR THE PRODUCTION OF PRINTS AND PAD-DYEINGS FAST TO RUBBING WITHOUT REQUIRING AN AFTER - TREATMENT ON NITROGEN-CONTAINING FIBROUS MATERIALS

Erich Feess and Sienling Ong, Lorsbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed May 28, 1970, Ser. No. 41,587
Claims priority, application Germany, June 25, 1969, P 19 32 149.4
Int. Cl. D06p *5/02*
U.S. Cl. 8—165 **5 Claims**

Process for the production of prints and pad-dyeings fast to rubbing without requiring an after-treatment on nitrogen-containing fibrous materials, by using printing pastes or padding baths which contain, in addition to dyestuffs suitable for these fiber types as well as emulsion thickenings, also aqueous dispersions of styrene homopolymers, and fixing the prints and pad-dyeings by a treatment with steam and/or hot air and/or by exposure to radiation energy.

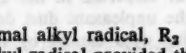
3,671,182

PROCESS FOR THE DYEING OF CELLULOSE DIACETATE FIBERS FROM BASIC DYE BATHS CONTAINING SULFURIC ESTER SALTS

Minoru Ozutsumi, Kazuo Kawakami, Sumio Ishizaki, and Masatoshi Kurosawa, Tokyo, Japan, assignors to Hodogaya Kagaku Kabushiki Kaisha, Minato-ku, Tokyo, Japan

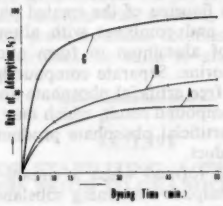
Filed Oct. 6, 1969, Ser. No. 864,010
Int. Cl. D06p *3/40, 5/04*
U.S. Cl. 8—170 **5 Claims**

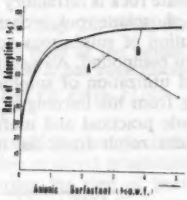
Dyeing of cellulose diacetate fibers as well as yarns, threads and textile fabrics made thereof with basic dyestuffs. The dyeing is carried out in the presence of a salt of sulfuric ester of aliphatic alcohol represented by the formula:



wherein R_1 is a normal alkyl radical, R_2 is a hydrogen atom or a normal alkyl radical provided that the sum of the carbon atoms contained in the radicals R_1 and R_2 is nine, and M is member selected from the group of Na, K and NH_4. The dyeings thus obtained are characterized by their deep and brilliant shades having outstanding

fastness properties, especially light fastness as compared with those of the dyeings obtained by the use of other





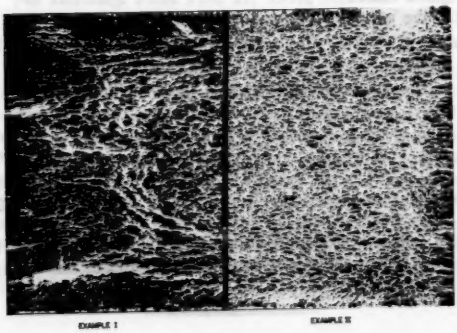
salts of sulfuric esters of aliphatic alcohols containing less or more than ten carbon atoms.

3,671,183

MANUFACTURING A SENSITIVE NON-FLAMMABLE DYE PENETRANT

Orlando G. Molina, Westminster, Calif., assignor to North American Rockwell Corporation

Filed Mar. 5, 1970, Ser. No. 16,806
Int. Cl. D06p *1/68*
U.S. Cl. 8—85 **7 Claims**



A first homogeneous aqueous liquid fluorescent dye penetrant, containing a major proportion of water, is processed into a second homogeneous liquid dye penetrant, formed by extracting the first liquid with a volatile, stable halocarbon, liquid at room temperature. The second liquid, a halocarbon extract, noticeable less fluorescent than the first aqueous liquid penetrant, is a more sensitive liquid dye penetrant microcrack detector. The halocarbon dye penetrant is also nonflammable.

3,671,184

MODIFYING CELLULOSIC FABRIC WITH DICARBOXYLIC ACIDS TO IMPART WATER-DISPERSIBILITY

John Anthony Cuculo, Raleigh, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 26, 1969, Ser. No. 827,975
Int. Cl. D06m *13/20;* **A61f** *13/16*
U.S. Cl. 8—120 **4 Claims**

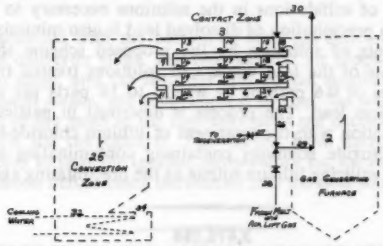
Cellulose half-acid esters are prepared by impregnating cellulosic material with a concentrated aqueous solution of an organic dicarboxylic acid anhydride and ammonia, heating the impregnated cellulose material at 160° to 210° C. for about 10 to 60 seconds until the desired ester substitution has occurred, washing the esterified cellulose, and neutralizing the free carboxyl radicals with a solution containing metal ions. The examples illustrate the effect of varying the temperature and time on the degree of substitution obtained with succinic, phthalic and maleic anhydrides. Cellulosic fibers can be modified so that fabrics will disperse readily in water.

3,671,185

PURIFICATION OF WASTE GASES

Philip A. Lefrancois, Cranford, and Kenneth M. Barclay, Stockton, N.J., assignors to Pullman Incorporated, Chicago, Ill.

Filed Aug. 12, 1968, Ser. No. 751,933
Int. Cl. B01d *53/34*
U.S. Cl. 23—2 R **17 Claims**



Compounds of sulfur and of nitrogen and fly ash are removed from gases by absorption at between 1500° F. and 2000° F. under atmospheric to 5 atmospheres pressure in a molten carbonate salt of sodium, potassium and/or lithium, and the decontaminated combustion gas stream is cooled and vented to the atmosphere.

3,671,186

METHOD FOR PREPARING ZIRCONIUM TETRACHLORIDE AND HAFNIUM TETRACHLORIDE

Hiroshi Ishizuka, 19–2 Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Jan. 6, 1970, Ser. No. 934
Claims priority, application Japan, Jan. 11, 1969, 44/2,179
Int. Cl. C22b *59/00*
U.S. Cl. 23—24 Z **6 Claims**

A method for preparing zirconium tetrachloride having a low hafnium content and high purity hafnium tetrachloride from raw material zirconium tetrachloride containing hafnium tetrachloride in a relatively large amount, by forming a double salt between a salt and the raw material zirconium tetrachloride present in a larger amount than that required for formation of the double salt with the salt, decomposing the resulting double salt allowing vapors resulting from the decomposition, to react with the salts again to form a double salt, and repeating the decomposition, formation and decomposition of the double salt in a multi-stage manner to separate the hafnium content, to obtain zirconium tetrachloride having a low hafnium content, and at the same

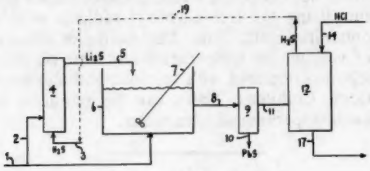
time concentrating the resulting hafnium tetrachloride contained in the raw material to obtain high purity hafnium tetrachloride.

3,671,187

REMOVAL OF DISSOLVED LEAD FROM ALKALI METAL CHLORIDE CONTAINING SOLUTIONS

Ephraim A. Cuevas, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 13, 1970, Ser. No. 54,406
Int. Cl. C01d 3/04, 11/02
U.S. Cl. 23—89 6 Claims



A process is described for the removal of lead from alkali metal chloride containing solutions by precipitation of the lead ions as a lead sulfide. The method involves utilizing an alkali metal sulfide as the precipitating agent in lieu of hydrogen sulfide. The use of alkali metal sulfide as the precipitating agent precipitates the lead in large particle sizes rendering filtration easy. The quantity of sulfide ions in the solutions necessary to accomplish precipitation of dissolved lead is also minimized. Treatments of solutions by the proposed scheme show reductions of the lead content of solutions treated from quantities of 0.6 percent by weight to 18 parts per million or less lead. The process is described in particular in connection with the treatment of lithium chloride-lithium hydroxide solutions containing contaminating lead ions and utilizing lithium sulfide as the precipitating agent.

3,671,188

PROCESS FOR RECOVERING BORON IN PRODUCTS RESULTING FROM ALKALINE ATTACK ON BOROCALCIC ORES

Pierre Mathis, Dombasle-sur-Meurthe, France, assignor to Solvay & Cie, Brussels, Belgium

No Drawing. Filed Sept. 17, 1969, Ser. No. 858,852
Claims priority, application Belgium, Sept. 30, 1968, 64,114, Patent 721,615
Int. Cl. C01b 25/00
U.S. Cl. 23—59 9 Claims

Borocalcic ore is treated with an aqueous solution containing a carbonate, bicarbonate, hydroxide, or mixture thereof of at least one alkali metal compound. The resultant aqueous solution is filtered and then washed with an aqueous solution which contains at least one of the alkali metal compounds present in the treating solution. The spent washing solution is recycled and used for the treatment of additional ore.

3,671,189

TREATMENT OF PHOSPHATE ROCK WITH ACIDS

Anson G. Betts, Plainfield, Mass.
(West Cummington, Mass. 01026)

No Drawing. Continuation-in-part of application Ser. No. 361,207, Apr. 20, 1964, which is a continuation-in-part of application Ser. No. 153,741, Mar. 20, 1961, which in turn is a continuation-in-part of application Ser. No. 768,554, Oct. 21, 1958. This application June 16, 1966, Ser. No. 559,371
Int. Cl. C01b 25/22; C01f 7/50
U.S. Cl. 23—88 10 Claims

Phosphate rock is decomposed by treatment with solution of acid selected from the group of acids named in the specification, using a proportion of acid sufficient to substantially complete the decomposition of the calcium fluophosphate of the used portion of the phosphate rock. There is provided and used in the acid treatment of the phosphate rock a reacting compound of aluminum used in the proportion stated in the specification, with the result that the fluorine of the treated phosphate rock chemically reacts and combines with aluminum of the used compound of aluminum to form a compound of aluminum and fluorine. Separate compounds of (1) substantially fluorine-free artificial phosphate and (2) of aluminum-fluorine compound result, which may be recovered separately in an artificial phosphate product and a solid fluoaluminate product.

Sulphurous acid formed when a stream of gas from combustion of a sulphur-containing substance is brought into an aqueous solution, may be used as the acid of treatment of phosphate rock, myself having discovered that while phosphate rock is refractory toward so-obtained sulphurous acid, phosphate rock is chemically decomposable by such solution of sulphurous acid containing a reactable aluminum compound. As a result of my discovery the recovery and utilization of sulphur dioxide from gas streams resulting from the burning of sulphur-containing substances is made practical and useful. New and useful phosphate products result from the use of my said discovery.

3,671,190

SYNTHETIC CLAY-LIKE MINERALS OF THE SMECTITE TYPE AND METHOD OF PREPARATION

Barbara Susan Neumann, Redhill, England, assignor to Laporte Industries Limited

No Drawing. Continuation of abandoned application Ser. No. 664,298, Aug. 30, 1967. This application Nov. 10, 1970, Ser. No. 88,394
Int. Cl. C01b 33/22
U.S. Cl. 23—111 14 Claims

Synthetic clay-like mineral of the smectite type having the general structural formula

$$[Si_8Mg_aLi_bH_{4+c}O_{24}]^{(12-2a-b-c)-}\cdot M(12-2a-b-c)+$$

and having

(i) M as a sodium, a lithium or an equivalent of an organic cation

(ii) the value of a, b and c such that either

$$a<6;\ b>0;\ c>0$$

and

$$b+c<2;\ \pm(a+b+c-6)<2$$

or

$$a<6;\ b=0;\ \pm c<2$$

and

$$\pm(a+c-6)<2$$

(iii) a cation exchange capacity of about 50 to 120 meq./100 g.

(iv) when M is Na^+ or Li^+, a Bingham yield value of at least 40 or 50 dynes/cm.^{2} as a 2% dispersion in tapwater.

3,671,191

PREPARATION OF HIGH SILICA SYNTHETIC FAUJASITE

Philip Kenerick Maher, Baltimore, Edwin Wolf Albers, Annapolis, and Carl Vance McDaniel, Laurel, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Sept. 16, 1970, Ser. No. 72,872
Int. Cl. C01b 33/28
U.S. Cl. 23—113 5 Claims

High silica crystalline aluminosilicates are prepared by forming an aqueous reaction mixture with sources of

sodium hydroxide, silica, alumina, and nucleation centers (seeds), a portion of the excess sodium hydroxide being neutralized by the addition of a strong mineral acid or ammonium sulfate, and crystallizing the reaction mixture at an elevated temperature. Sodium silicate solution can be used as the silica source. Partial neutralization of the sodium silicate solution with a strong mineral acid such as sulfuric acid prevents excess solubilization of the silica and thereby increases the silica to alumina ratio in the final product.

3,671,192

METHOD OF STABILIZING ACRYLIC POLYMER FIBERS PRIOR TO GRAPHITIZATION

Herbert M. Ezekiel, Dayton, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed May 28, 1968, Ser. No. 732,514

The portion of the term of the patent subsequent to Jan. 18, 1972, has been disclaimed

Int. Cl. C01b *31/07*

U.S. Cl. 23—209.1 **9 Claims**

A method of stabilizing acrylonitrile polymer fibers prior to carbonization or direct graphitization is described. The method comprises the step of heating the fibers at 265–290° C., preferably at 275° C., in an oxidizing atmosphere for, for example, about 3–7 hours, in a manner such as to dissipate the heat of reaction and allow controlled oxidation. The stabilization step when followed by graphitization of a polymer fiber or yarn at a temperature within the range of 1800–3200° C. leads to a graphite fiber of high tensile strength, high modulus of elasticity, and a fiber of improved graphitic character.

3,671,193

ZINC OXIDE CRYSTAL BULK-EFFECT OSCILLATOR AND METHOD OF PREPARING THE SAME

Stanley V. Jaskolski, N76 D22144 Chestnut Hill Road, Sussex, Wis. 53089, and Martin A. Seltz, 9133 W. Custer Ave., Milwaukee, Wis. 23225

No Drawing. Filed Feb. 11, 1970, Ser. No. 10,635

Int. Cl. C01g *9/02;* **G03c** *5/00*

U.S. Cl. 23—148 **5 Claims**

To provide a commercial zinc oxide single crystal with predetermined electrical characteristics it is cleaned, embedded in zinc oxide powder, and heated (e.g., for 1–3 hours at 750°–800° C.) in an atmosphere having a predetermined oxygen partial pressure (e.g., one part oxygen to 10,000 parts argon). Temperature and oxygen partial pressure are controlled to determine the resistivity characteristics. To shorten such treatment the crystal can be subjected to a preliminary heat treatment in air or oxygen at near-atmospheric pressure at about 750° C. for 3–18 hours.

3,671,194

SULFUR DIOXIDE CONVERSION

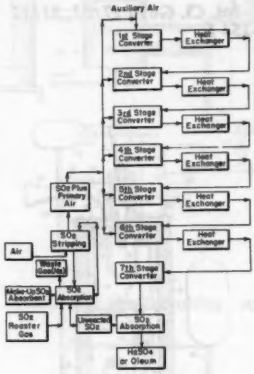
Edward S. Roberts, Bayside, N.Y., assignor to Treadwell Corporation, New York, N.Y.

Filed May 1, 1970, Ser. No. 33,614

Int. Cl. C01b *17/76, 17/72*

U.S. Cl. 23—176 **7 Claims**

A multi-stage method for catalytic conversion of SO_2 to SO_3 which can utilize a high concentration of SO_2 in the feed gas and which is capable of producing a high SO_3 concentration in the product gas is provided. The process involves distributing a portion of the feed gas to each of a series of catalytic converters, and mixing such portion at each stage with the off-gas from the preceding stage. Some oxygen for the process may be supplied in admixture with the feed gas, and the remainder



is admixed with the portion of feed gas delivered to the first converter stage. The feed gas and air supplied to the first stage, and the feed gas and off-gas supplied to subsequent stages, are proportioned so that the temperature rise of the gases in the converter does not exceed the safe value for the catalyst. The off-gas from each stage is cooled to near the ignition temperature for the conversion reaction before being introduced into the next stage.

3,671,195

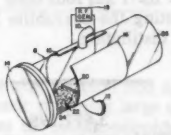
METHOD AND APPARATUS FOR ASHING ORGANIC SUBSTANCE

Richard L. Bersin, Kensington, Calif., assignor to International Plasma Corporation

Filed Aug. 19, 1968, Ser. No. 753,593

Int. Cl. G01m *31/12, 1/00;* **H05h** *1/16*

U.S. Cl. 23—230 PC **6 Claims**



A support structure for a specimen to be treated in the chamber of a plasma machine wherein excited gas flows through the chamber for reaction with the specimen, such structure being fabricated of a fibrous material shaped to be supported inside the reaction chamber and to carry the specimen, the material itself being a substance which is inert to the excited gas yet permeable thereto, whereby the excited gas flows through as well as around the support structure and thus into substantial contact with the surfaces of the specimen to be treated.

3,671,196

APPARATUS FOR A QUANTITATIVE ANALYSIS OF A GAS OR GAS MIXTURE IN RESPECT OF ITS CONTENT OF ORGANIC SUBSTANCES

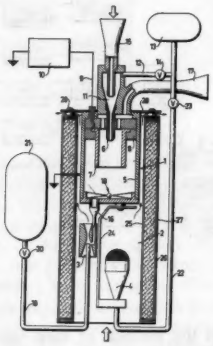
Arnold Brantte, Hasselstigen 4, Solna, Sweden; Bengt Harald Ivar Frostling, Kruthornsvagen 32A, Sollentuna, Sweden; and Per-Henning Lindgren, Ringgatan 20C, Uppsala, Sweden

Filed Nov. 10, 1969, Ser. No. 875,095

Claims priority, application Sweden, Nov. 14, 1968, 15,440/68

Int. Cl. G01n *27/62, 31/12*

U.S. Cl. 23—254 R 5 Claims



An apparatus for analyzing gas comprising an ionization detector, a gas ejector for sucking gas through said ionization detector, and a catalytic gas burner for supplying heat to the chamber surrounding said detector and ejector.

3,671,197

TREATMENT OF PYRITES

Nicholas E. Mascio, Verona, and Robert F. Burke, Riverdale, N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Feb. 5, 1970, Ser. No. 8,837

Int. Cl. C21b *1/04*

U.S. Cl. 23—200 13 Claims

Process for treating pyrites wherein the pyrites is directly contacted with an inert gas under conditions to produce pyrrohtite by freeing the labile sulfur from the pyrites, the inert gas providing the heat requirements for the sulfur distillation. The sulfur is recovered from the inert gas and the inert gas indirectly heated by an off-gas produced in roasting the pyrrohtite for subsequent passing to the sulfur distillation.

3,671,198

CRACKING FURNACE HAVING THIN, STRAIGHT SINGLE PASS REACTION TUBES

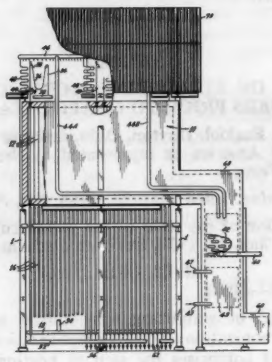
Bruce Alden Wallace, White Plains, N.Y., assignor to Pullman Incorporated, Chicago, Ill.

Continuation-in-part of application Ser. No. 683,703, Nov. 16, 1967. This application June 15, 1970, Ser. No. 46,043

Int. Cl. B01j *3/00;* C10b *1/04;* C10g *9/04*

U.S. Cl. 23—277 10 Claims

The present invention concerns a method and apparatus for treating a hydrocarbonaceous process fluid by indirectly heating such fluid to high temperatures in extremely short periods of time and then rapidly cooling. The process fluid is passed into the straight single pass reaction tubes of the novel heater of this invention, such reaction tubes being contained in a refractory enclosure. The tubes are each connected to an individual quench tube wherein the process fluid may be rapidly cooled either by a coolant flowing through a plurality of jackets



each surrounding each individual quench tube or, in another embodiment, the process fluid may be cooled by having the quench tubes immersed in a liquid bath. In another embodiment of this invention a method and apparatus is provided for carrying out the aforementioned method while simultaneously decoking individual reaction tubes.

3,671,199

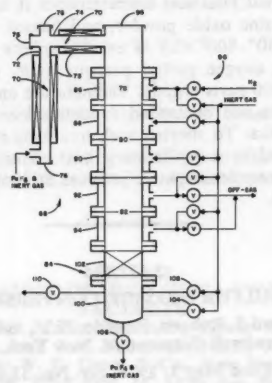
PLUTONIUM HEXAFLUORIDE REDUCTION

Orville E. Heady, Broomfield, John F. Towell, Denver, and Richard L. Standifer, Arvada, Colo., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 4, 1969, Ser. No. 804,198

Int. Cl. B01j *1/14*

U.S. Cl. 23—284 6 Claims



An apparatus and method for reducing plutonium hexafluoride to plutonium tetrafluoride by heating the pluto-

nium hexafluoride in a first zone, then mixing the heated plutonium hexafluoride with hydrogen in a second zone and collecting solid plutonium tetrafluoride in a third zone, while removing gas and gaseous products from the second zone.

3,671,200

METHOD OF GROWING CRYSTALS BY SHIFTING THE EQUILIBRIUM OF CHEMICAL COMPLEXES

Alton F. Armington, Lexington, and John J. O'Connor, Arlington, Mass., assignors to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed May 6, 1969, Ser. No. 822,322

Int. Cl. B01j *17/04;* **C01g** *13/00*

U.S. Cl. 23—300 **4 Claims**

A method for effecting the solution growth of single crystals from insoluble crystal forming materials. The method includes forming a solution of the crystal growing material by first complexing the material to render it soluble followed by the decomposition or deactivation of the complexed material. This allows the desired crystal growing material to precipitate out of solution in single crystal form. Decomposition is accomplished by heating the complexed solution at a temperature and for a period of time sufficient to shift the equilibrium of the chemically complexed material and render it insoluble.

3,671,201

NICKEL-MOLYBDENUM BONDED TITANIUM NITRIDE-TITANIUM CARBIDE

Horacio E. Bergna, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,892

Int. Cl. B22f *3/00;* **C04b** *35/52*

U.S. Cl. 29—182.5 **5 Claims**

Solid compositions of from 49.5 to 94 volume percent titanium nitride, and 5 to 49.5 volume percent titanium carbide bonded with from 1 to 15 volume percent of metal composed of 20 to 50 volume percent nickel and 50 to 80 volume percent molybdenum, the composition having an average grain size of less than 2 microns and a density of at least 99 percent of theoretical are prepared by hot-pressing an intimate mixture of fine powdered titanium nitride, titanium carbide and metal at a temperature between 1650° and 1900° C. and a pressure between 1000 and 5000 pounds per square inch. The dense compositions are very strong and hard and possess a very desirable combination of oxidation resistance, wear-resistance, scratch-resistance and corrosion resistance.

3,671,202

CONCENTRATION OF WET-PROCESS PHOSPHORIC ACID

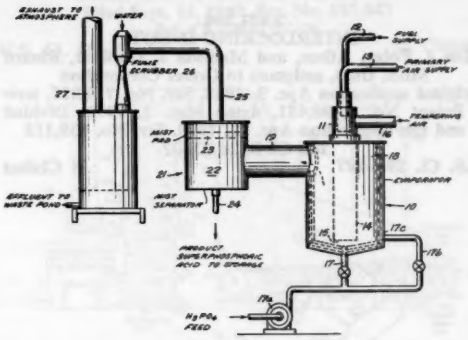
Charles J. Esterhoy, Jr., Morris Plains, and William D. Hunter, Jr., Smokerise, Kinnelon Borough, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 21, 1964, Ser. No. 346,514

Int. Cl. B01d *1/14;* **C01f** *25/22*

U.S. Cl. 23—307 **7 Claims**

This invention relates to the concentration of wet-process phosphoric acid to produce superphosphoric acid by contacting wet-process phosphoric acid, preferably containing from about 50–55% P_2O_5, with a stream of hot combustion gases in such a volume and at such a velocity to substantially completely entrain all of the wet-process phosphoric acid, continuously feeding the stream of heating gas containing the entrained acid into a zone where coalescence of the acid particles is effected and



continuously removing the resulting superphosphoric acid.

3,671,203

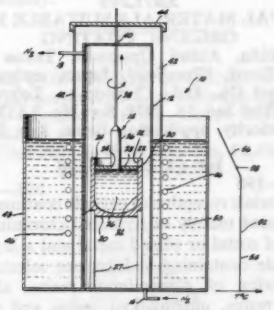
METHOD AND APPARATUS FOR CZOCHRALSKI GROWTH OF LARGE CRYSTALS

Anthony L. Gentile, Thousand Oaks, and Oscar M. Stafsudd, Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 29, 1968, Ser. No. 733,038

Int. Cl. C01g *3/12, 5/00;* **B01d** *9/00*

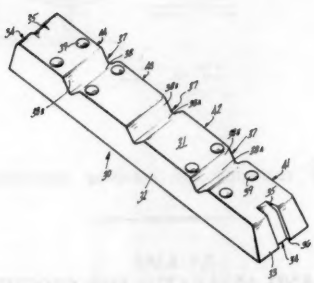
U.S. Cl. 23—315 **19 Claims**



A modified Czochralski method and apparatus for synthesizing at atmospheric pressures large single melt-drawn crystals selected from the sulfide-selenide-telluride family of the following Periodic Table Group combinations: I–B—V—VI–B, II–B—IV–B—VI–B, II–B—V—VI–B, I–B—VI–B, III—VI–B, IV–B—VI–B, and V—VI–B, which are meltable at atmospheric pressures. A stoichiometric mixture is made of the desired crystal constituents, with which a slag suppressant may be added and prereacted. The starting materials are placed within the Czochralski furnace crucible and a buoyant solid novel cover is placed over these materials to prevent volatilization of one or more of the crystal constituents, which otherwise would destroy stoichiometry of the melt materials and form nucleation sites. A dynamic inert atmos-

phere is utilized and the materials are heated into a melt. The crystals are then drawn through a central hole in the cover.

3,671,204
INTERLOCKING INGOT
Alan J. Foley, Athen, and Madison J. Gardner, Rinard Mills, Ohio, assignors to Ormet Corporation
Original application Apr. 9, 1968, Ser. No. 719,925, now Patent No. 3,498,451, dated Mar. 3, 1970. Divided and this application Apr. 21, 1969, Ser. No. 839,115
Int. Cl. B22d *25/02*
U.S. Cl. 29—187 **8 Claims**



The disclosure teaches an interlocking ingot with a base portion having at least one cavity therein and a plurality of discrete nibs thereon and with a top portion having a plurality of concave portions therein to receive nibs from another like ingot to form a mechanical interlock therewith.

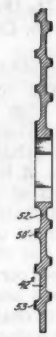
3,671,205
METAL MATERIALS SUITABLE FOR ORGANIC COATING
Hiromu Uchida, Akimi Umezono, Takao Saito, and Tsutomu Enari, Himeji-shi, Japan, assignors to Fuji Iron & Steel Co., Ltd., Chiyoda-ku, Tokyo, Japan
Filed Jan. 16, 1970, Ser. No. 3,432
Claims priority, application Japan, Jan. 22, 1969, 44/4,646
Int. Cl. B32b *15/04*
U.S. Cl. 29—195 **12 Claims**

Metal materials receptive to organic coatings and having a film composed mainly of hydrated chromium oxide on the surface of metal or plated metal and a layer of water soluble vehicle containing at least one selected from the group consisting of oleoresinous resins, alkyd resins, aminoalkyd resins, phenolalkyd resins and acrylic, resins on the hydrated chromium oxide film.

3,671,206
ALLOY, FUSION OVERLAY AND PROCESS
John F. Lynch, Chester, Pa., and William Bryson Scott, Cherry Hill, and Alfred J. Paoletti, Willingboro, N.J., assignors to Marco Development Co., Inc., New Castle, Del.
Filed Jan. 12, 1971, Ser. No. 105,815
Int. Cl. B32b *15/00*; C22c *19/00*
U.S. Cl. 29—196.6 **9 Claims**

In making pump parts such as impellers, shafts, bearings and the like, a suitable backing such as steel is coated with a fused overlay of an alloy of tin, bismuth, silicon, boron, iron, molybdenum, optionally tungsten, and the balance nickel. This gives to the parts coated bearing properties and corrosion resistance without the danger of excessive porosity. The coating is deposited and fused by conventional overlay methods.

3,671,207
ALLOY, FUSION OVERLAY AND PROCESS
John F. Lynch, Chester, Pa., and William Bryson Scott, Cherry Hill, and Alfred J. Paoletti, Willingboro, N.J., assignors to Marco Development Co., Inc., New Castle, Del.
Filed Jan. 12, 1971, Ser. No. 105,816
Int. Cl. C22c *13/00*; B32b *15/00*
U.S. Cl. 29—196.6 **9 Claims**

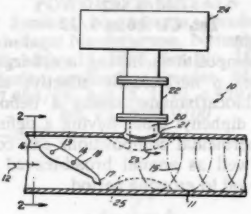


In making pump parts such as impellers, shafts, bearings and the like, a suitable backing such as steel is coated with a fused overlay of an alloy of tin, bismuth, silicon, boron, optionally chromium and the balance nickel. This gives to the parts coated bearing properties and corrosion resistance without the danger of excessive porosity. The coating is deposited and fused by conventional methods.

3,671,208
FLUID MIXING APPARATUS
Wayne G. Medsker, Mountain View, Mo. (1321 S. Lakeview, Sturgis, Mich. 49091)
Filed Oct. 9, 1970, Ser. No. 79,570
Int. Cl. B01f *3/02, 3/04*
U.S. Cl. 48—180 C **4 Claims**

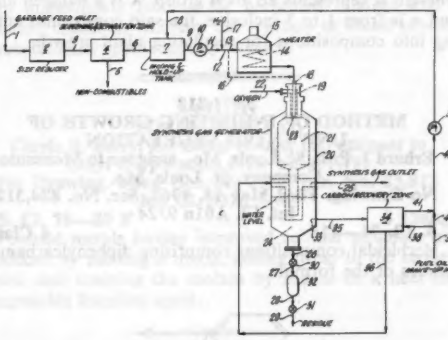
A vortex fluid mixing apparatus is provided for mixing one fluid to another in a conduit or for creating a vortex in fluid passing through a tube breaking up fluid entrained

to the sides of the tube. A tube is provided having a fluid vortex mixer attached to the inner surface of the tube for producing a vortex in the fluid passing through the tube. The vortex mixer is an elongated member and is fixedly attached to the inside of a tube either singularly or



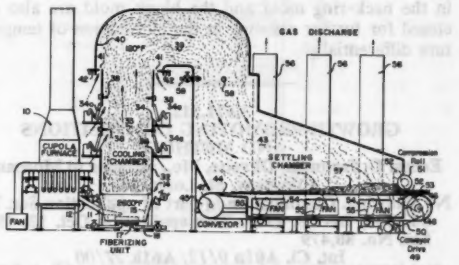
in plural numbers and may be used in mixing a second fluid with the first by having second fluid enter the tube at the beginning of the vortex being generated and may have a vortex mixer also placed in the feeder tube or may be fed into a venturi in the tube.

3,671,209
GARBAGE DISPOSAL PROCESS
Charles F. Teichmann, Houston, Tex., and Albert Brent, Dix Hills, N.Y., assignors to Texaco Development Corporation, New York, N.Y.
Filed Dec. 21, 1970, Ser. No. 100,108
Int. Cl. C10j *3/00, 3/16*
U.S. Cl. 48—209 **6 Claims**



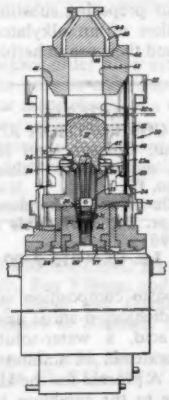
Garbage and other inorganic and organic solid waste matter is reduced to small size and mixed with a fluid selected from the group consisting of H_2O, liquid hydrocarbon fuel, liquid hydrocarbon fuel-particulate carbon slurry or particulate carbon-water slurry produced subsequently in the process, and mixtures thereof to produce a feed mixture stream. The feed mixture is preferably preheated to produce a feed dispersion stream comprising bits of garbage and solid waste matter, particulate carbon, liquid and vaporized hydrocarbon fuel, and steam. By the partial oxidation of the feed mixture or dispersion stream with a stream of oxygen-rich gas in the reaction zone of a free-flow unpacked noncatalytic synthesis gas generator at an autogenous temperature in the range of about 1500 to 3000° F. and at a pressure in the range of about 1 to 250 atmospheres, the garbage and solid waste matter are converted into a stream of synthesis gas or fuel gas, and other valuable by-products.

3,671,210
METHOD AND APPARATUS FOR FIBERIZING MOLTEN MINERAL MATERIALS
Charles D. Richardson, Muncie, Ind., assignor to Richardson Service, Inc., Muncie, Ind.
Filed Sept. 15, 1969, Ser. No. 857,847
Int. Cl. C03b *37/06*
U.S. Cl. 65—5 **21 Claims**



This disclosure provides a method and apparatus for converting molten material such as slag, glass, rock or the like into fibers. A featheredge of molten material is provided in conjunction with a supply bath. A featheredge, by definition, is a section that is made as thin as possible. A pressurized flow of fluid medium is directed along the featheredge to cause the molten material to be forcefully transported as streamers into the area directly above the supply bath. Nozzle openings are provided along the featheredge to direct a pressurized flow of fluid medium into the featheredge of molten material. An assembly is provided in which a fiberizing vessel is fixedly mounted at the bottom of a vertically extending housing which forms a fiberizing chamber. A controlled atmosphere is established in the fiberizing chamber for obtaining the desired structural characteristics in the solidified fibers formed therein. The fiberizing chamber is operatively connected to a settling chamber in which the fiber material is collected for further processing and/or discharge from the assembly.

3,671,211
PLUNGER FOR BOTTLE MAKING MACHINE
Adam J. Lloyd, deceased, late of Millville, N.J., by Leona A. Lloyd, executrix, 338A Court Blvd., Milville, N.J. 08332
Filed July 6, 1970, Ser. No. 52,485
Int. Cl. C03b *9/36*
U.S. Cl. 65—234 **5 Claims**



A vented plunger tip is provided for use with the Hartford I.S. Machine and similar blow and blow bottle equip-

ment to vent air trapped by the glass gob as the glass gob is being forced into the mold and into engagement with the plunger tip to eliminate temperature variations and to thereby reduce settle wave problems. Central vent holes communicate from the tip of the plunger to an axial bore and exhaust ports extend from the axial bore through the side walls of the plunger to permit trapped air from the area near the tip of the plunger to escape. Pad vents in the neck ring mold and the blank mold are also disclosed for further assisting in the elimination of temperature differentials.

3,671,212
GROWTH-PROMOTING COMPOSITIONS AND METHODS
Ernest G. Jaworski, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 883,336, Dec. 8, 1969. This application Oct. 13, 1970, Ser. No. 80,479
Int. Cl. A01n *9/12*; A61k *27/00*
U.S. Cl. 71—77 **12 Claims**

The growth of living organisms is stimulated by augmenting the nutrient medium utilized by the organism with 4-methylthiobutyric acid or a biological equivalent of said acid.

3,671,213
HERBICIDAL COMPOSITIONS
Brian Graham White, Bracknell, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed July 5, 1968, Ser. No. 742,482
Claims priority, application Great Britain, July 10, 1967, 31,669/67
Int. Cl. A01n *9/22*
U.S. Cl. 71—94 **3 Claims**

Complexes of a herbicidal bipyridylium quaternary salt having 1–4 molecular proportions of a complexing agent are provided. The complexing agent has a nucleus which is aromatic or heterocyclic and bears at least 1 substituent of hydroxy, amino nitro, carboxyl or mercapto. The bipyridylium salt which is complexed is applied to inhibit the growth of vegetation.

3,671,214
INHIBITING THE GROWTH OF PLANTS WITH SUBSTITUTED INDOLE DERIVATIVES
Gerhard H. Alt, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Jan. 2, 1970, Ser. No. 396
Int. Cl. A01n *9/22*
U.S. Cl. 71—95 **4 Claims**

Novel process for preparing substituted indole derivatives by the reaction of an alkylated aniline with an α-hydroxy ketone and their use in herbicidal compositions.

3,671,215
SILVICIDAL COMPOSITION AND METHOD
Travis L. Bellsmith, Chicago, and Richard W. Fields, St. Charles, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.
No Drawing. Continuation of abandoned application Ser. No. 632,893, Apr. 24, 1967. This application Jan. 2, 1970, Ser. No. 490
Int. Cl. A01n *9/00*
U.S. Cl. 71—97 **9 Claims**

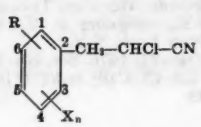
A tree killing paste composition comprising a water-soluble salt of 3,6-dichloro-o-anisic acid or 4-amino-3,5,6-trichloropicolinic acid, a water-soluble acid methanearsonate salt and water in an amount such that the composition is a paste. A process for the killing of trees which comprises applying to the cambium layer thereof, in an amount which is silvicidally toxic to said trees, a composition of this invention.

3,671,216
HERBICIDAL COMPOSITIONS
Masaru Kado, Yokohama, Ichiro Kimura, Ogasa-gun, Shizuoka, and Hironari Sugiyama, Shimizu, Japan, assignors to Kumiai Chemical Industry Co., Ltd., and Hodogaya Chemical Co., Ltd., Tokyo, Japan
No Drawing. Filed Feb. 4, 1970, Ser. No. 8,715
Claims priority, application Japan, Feb. 6, 1969, 44/8,582
Int. Cl. A01n *9/12*
U.S. Cl. 71—100 **10 Claims**

Herbicidal compositions having a synergistic activity, which comprises a herbicidally effective amount of a mxture of a thiocarbamate having a defined chemical formula and a diphenyl ether having a defined chemical formula. The herbicidal compositions can control perennial weeds as well as annual broad-leaved weeds from germinating period to growing period.

3,671,217
PLANT GROWTH REGULANTS
Joseph Rene Brepoels, Heppen, Limbourg, and Armand August Florent Busschots, Sint-Truiden, Limbourg, Belgium, assignors to S.A. PRB, Brussels, Belgium
No Drawing. Filed July 5, 1968, Ser. No. 742,512
Claims priority, application Belgium, July 7, 1967, 701,102
Int. Cl. A01n *9/20*
U.S. Cl. 71—105 **12 Claims**

The invention relates to compounds of the formula:

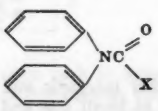


(I)

wherein R represents an alkyl group, X is a halogen atom and *n* is from 1 to 3 inclusive, the said compounds entering into compositions for regulating plant growth.

3,671,218
METHOD OF INHIBITING GROWTH OF UNWANTED VEGETATION
Erhard J. Prill, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed May 13, 1969, Ser. No. 824,312
Int. Cl. A01n *9/24*
U.S. Cl. 71—115 **4 Claims**

Herbicidal compositions comprising diphenylcarbamoyl halides of the formula



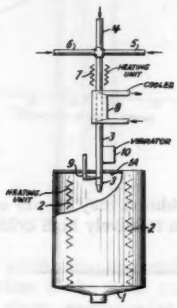
wherein X is a halogen selected from the group consisting of chlorine and bromine.

3,671,219
RIPENING OF SUGARCANE BY USE OF CERTAIN QUATERNARY AMMONIUM HALIDES
Louis G. Nickell, Honolulu, Hawaii, assignor to Hawaiian Sugar Planters' Association, Honolulu, Hawaii
No Drawing. Filed July 20, 1970, Ser. No. 56,735
Int. Cl. A01n *9/20*
U.S. Cl. 71—121 **11 Claims**

Sucrose yield of sugarcane is increased by treating sugarcane a few weeks prior to harvest with a quaternary ammonium salt which is a benzyl dimethyl alkyl or substituted alkyl ammonium halide, wherein the alkyl or

substituted alkyl group contains between 1 and 20 carbon atoms. Representative compounds are benzyldimethyltetradecylammonium chloride and benzyltrimethylammonium chloride.

3,671,220
PROCESS FOR THE PRODUCTION OF POWDERED METALS
Kurt Alfred Jonsson, Nynashamn, Sweden, assignor to Rederiaktiebolaget Nordstjernan, Nynashamn, Sweden
Filed May 11, 1970, Ser. No. 35,991
Claims priority, application Sweden, May 19, 1969, 7,003/69; Apr. 2, 1970, 4,529/70
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5 B **9 Claims**



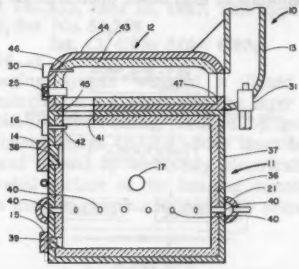
An apparatus and process are provided for reducing metal halides to metal powder low in halide content, the process comprising providing a preheated substantially uniform mixture of reactants comprising a metal halide uniformly dispersed through hydrogen at a temperature above the reaction temperature for said reactants, and then immediately feeding the preheated mixture into a reaction chamber, whereby the reaction to metal powder is substantially spontaneously effected.

3,671,221
FOAMED METAL
Currie B. Berry, Jr., Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Oct. 30, 1970, Ser. No. 85,813
Int. Cl. B31d *3/00*
U.S. Cl. 75—20 F **8 Claims**

Foamed metals having improved cellular structure are produced by melting a metal, adding dross to the molten metal, and foaming the molten by means of a heat decomposable foaming agent.

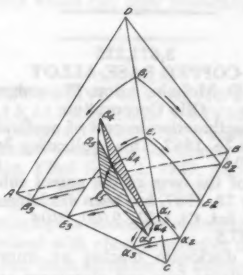
3,671,222
SILVER RECOVERY FROM PHOTOGRAPHIC WASTES
Edward B. Johnson, 4654 34th St. N., Arlington, Va. 22207
Filed Nov. 24, 1969, Ser. No. 879,144
Int. Cl. C22b *11/02, 7/00*
U.S. Cl. 75—83 **2 Claims**

A method for the rendering of silver from photographic waste in which the film or other waste is ignited and brought up to a satisfactory burning temperature in a primary chamber and maintained at this temperature until the film or waste is burned by controlling the amount of oxygen supplied to the primary chamber. The burning of the photographic waste is controlled so that the temperature of the gases and particulate matter resulting from the burning of the photographic waste is above about 1200° F. and below about 1500° F. as the gases and particulate matter are about to leave the primary chamber. During the ignition and burning of the photographic waste the smoke and particulate matter is directed to a secondary chamber where it is subjected to burning at a temperature that is higher than that in the primary chamber. After the photographic waste is burned, the silver bearing ash is cooled and removed from the primary



chamber. The ash is then processed by conventional techniques to refine the silver. This method permits the economical rendering of silver from photographic waste by burning with the elimination or reduction of smoke and other air pollutants.

3,671,223
ANISOTROPIC POLYPHASE STRUCTURE OF MULTIVARIANT EUTECTIC COMPOSITION
Earl R. Thompson, Glastonbury, Conn., and Franklin D. Lemkey, Oxford, England, assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Dec. 10, 1969, Ser. No. 883,713
Int. Cl. C22c *19/00, 39/20*
U.S. Cl. 75—122 **10 Claims**



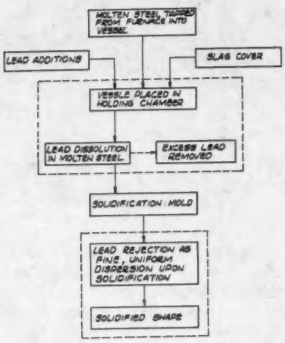
POLYTHERMAL PROJECTION OF A QUATERNARY ALLOY SYSTEM FREEZING BY THE REACTION $L \rightarrow \alpha_1 + \beta$

Quaternary or higher order alloy systems are unidirectionally solidified to provide anisotropic polyphase structures wherein one or more phases of a whisker or lamellar morphology in substantial alignment is embedded in a matrix phase. Included in the systems described are the cobalt, nickel and iron alloys containing chromium, aluminum and/or nickel.

3,671,224
METHODS OF PRODUCING LEADED STEEL
Donald F. North, Jr., Bay Village, and Jerry D. Thomas, Bedford Heights, Ohio, and Gerald W. Worth, St. Louis, Mo., assignors to Republic Steel Corporation, Cleveland, Ohio
Filed Aug. 17, 1970, Ser. No. 64,230
Int. Cl. C22c *39/54*
U.S. Cl. 75—129 **11 Claims**

Lead additions to steel are made and an improved leaded steel product is obtained by effectively utilizing the

significant solubility of lead in steel at temperatures above the liquidus temperature of the steel. This is accomplished by control of process conditions, including adding the lead to the steel in a vessel separate from the casting mold, allowing a minimum time between the addition of the lead and the pouring and casting of the leaded steel, the use of specific amounts of lead based upon a target percentage


MOLTEN STEEL TAPPED FROM FURNACE INTO VESSEL
LEAD ADDITIONS
SLAG COVER
VESSEL PLACED IN HOLDING CHAMBER
LEAD DISSOLUTION IN MOLTEN STEEL
EXCESS LEAD REMOVED
SOLIDIFICATION: MOLD
LEAD REJECTION AS FINE, UNIFORM DISPERSION UPON SOLIDIFICATION
SOLIDIFIED SHAPE

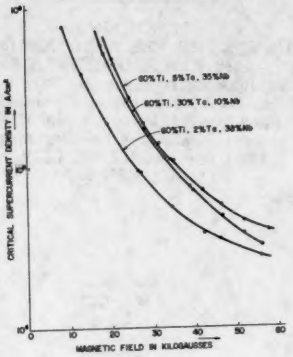
of lead to be obtained in the cast steel, which target percentage does not exceed the solubility level of lead in the steel, and the addition of the lead when the temperature of the steel is above the liquidus temperature by at least a minimum amount. The lead content in steel cast continuously or into ingots in accordance with this proces is uniformly and finely dispersed and the steel is characterized by an absence of macrosegregation of lead.

3,671,225
COPPER BASE ALLOY
Charles D. McLain, Alton, Ill., assignor to Olin Corporation
No Drawing. Continuation-in-part of application Ser. No. 649,003, June 26, 1967. This application June 29, 1970, Ser. No. 50,894
The portion of the term of the patent subsequent to July 28, 1987, has been disclaimed
Int. Cl. C22c *9/00, 9/04*
U.S. Cl. 75—157.5 **10 Claims**

The present disclosure teaches an improved copper base alloy containing iron and aluminum and a material selected from the group consisting of phosphorus and zinc and mixtures thereof. The alloys of the present invention are characterized by improved physical properties, in particular high strength and high conductivity.

3,671,226
SUPERCONDUCTIVE ALLOYS
Toranosuke Komata, Katsumi Ishihara, and Yasuo Hashimoto, Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of application Ser. No. 617,681, Feb. 21, 1967. This application Apr. 22, 1969, Ser. No. 818,453
Claims priority, application Japan, Feb. 28, 1966, 41/11,687
Int. Cl. H01f *7/22*; C22c *15/00*
U.S. Cl. 75—175.5 **4 Claims**

The disclosed superconductive alloys comprise essentially, by atomic percent, from 20 to 80% of titanium, from 1 to 80% tantalum and from 2 to 80% of niobium. They are excellent in workability and have the magnetic field-to-critical supercurrent density characteristics substantially identical to the supercurrent-to-critical magnetic field



characteristics. In addition they do not exhibit the training effect and have a relatively high critical temperature.

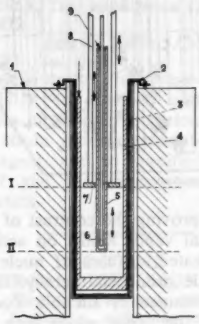
3,671,227
LOW TEMPERATURE Zn-Al-Cu CASTING ALLOY
Herbert A. Jahnle, Havertown, Pa., assignor to The Budd Company, Philadelphia, Pa.
No Drawing. Filed Sept. 30, 1969, Ser. No. 862,482
Int. Cl. C22c *17/00*
U.S. Cl. 75—178 AC **1 Claim**

Alloys having low melting points and high creep resistance especially adapted for casting molding tools, e.g., stamping dies consisting essentially of aluminum, zinc and copper wherein the amount of aluminum is from about 10 to about 30% by weight and the amount of copper is from about 10 to about 20% by weight, said percentages being based on the weight of the alloy. The alloy may additionally contain up to about 2% by weight of nickel and/or iron.

3,671,228
METHOD OF MAKING HIGH-DENSITY SINTERED METAL
Hoy C. McIntire and John R. Vanorsdel, Columbus, Ohio, assignors to The Battelle Development Corporation, Columbus, Ohio
Continuation-in-part of applications Ser. No. 645,624, June 13, 1967, Ser. No. 728,038, May 9, 1968, and Ser. No. 778,580, Nov. 25, 1968. This application Oct. 30, 1969, Ser. No. 872,481
Int. Cl. B22f *1/00*
U.S. Cl. 75—207 **45 Claims**

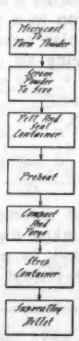
A method for making high-density (at least 90 percent of theoretically solid) metal bodies from reducible metal compounds which consists of exposing compacted particles of such compounds, at least 35 percent (by weight) of which are of less than 10 microns in diameter, to a reducing environment at a temperature within a range of from the lowest temperature at which reduction will take place to a temperature where sintering occurs and then subjecting said powders to sintering. In a preferred embodiment of the present invention metal compound powders are employed that have a mean particle size no greater than 6 microns and at least 25 percent of the powder has a particle size no greater than about 2.5 microns. Optimum results are obtained where the average apparent particle size is less than one micron.

3,671,229
PROCESS FOR PURIFICATION OF METALS
Martin Emile Ferber and Michel Georges Wintenberger, Grenoble, France, assignors to Compagnie Pechiney, Paris, France
Filed Dec. 3, 1969, Ser. No. 881,838
Claims priority, application France, Dec. 6, 1968, 176,897
Int. Cl. B22f 1/00
U.S. Cl. 75—211 11 Claims



A process for purification of metals such as aluminum by cooling a portion of the metal maintained at a liquid state at slightly above melting point temperature whereby crystals form and collect at the bottom and are sintered by compacting to increase the crystal size and minimize entrainment of impure metal.

3,671,230
METHOD OF MAKING SUPERALLOYS
John W. Smythe and Philip I. Karp, Ann Arbor, Mich., assignors to Federal-Mogul Corporation
Filed Feb. 19, 1969, Ser. No. 800,541
Int. Cl. B22f 1/00
U.S. Cl. 75—213 6 Claims



A process for making a superalloy having improved properties whereby a molten alloy is initially microcast in a nonoxidizing, substantially moisture-free atmosphere, forming a metallic powder of a controlled particle size and shape and having an oxygen content of less than about 100 p.p.m., and thereafter confining the powder in a deformable metal container while in a protected atmosphere and simultaneously compacting and forging the powder at an elevated temperature and at a controlled rate, forming a substantially dense solid mass characterized by its substantially uniform fine-sized wrought-type grain structure.

3,671,231
IMAGING SYSTEM
Werner E. L. Haas, Webster, and James E. Adams, Ontario, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation-in-part of application Ser. No. 4,644, Jan. 21, 1970, which is a continuation-in-part of application Ser. No. 646,533, June 16, 1967. This application June 30, 1970, Ser. No. 51,258
Int. Cl. G03c 5/04; G03g
U.S. Cl. 96—1 16 Claims

An imaging system wherein a liquid crystalline imaging material on a photoconductive layer is provided with a suitable overcoating, imaged by providing an electrical latent image on the above described imaging member, and erased by uniformly electrically charging the overcoated surface of the imaging member, thereby making the imaging member immediately reusable.

3,671,232
ELECTROPHOTOGRAPHIC MEMBER USEFUL AS A LITHOGRAPHIC MASTER
Charles A. Kumins, Barrington Hills, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.
No Drawing. Filed Nov. 23, 1970, Ser. No. 92,191
Int. Cl. G03g 5/00, 7/00
U.S. Cl. 96—1.8 5 Claims

A method of making a lithographic master using a photoconductive member which contains infrared absorbing carbon black in the photoconductive coating in the amount ranging from 0.25% to 1% by weight of the photoconductive pigment. The method calls for fusing the ink receptive thermoplastic resin powder by infrared radiation. The presence of carbon black in the face coat achieves a unique balance in the amount of heat necessary to fuse the fine lines which form a part of the image, without fusing the spurious toner particles deposited in the background which can later physically be removed.

3,671,233
PHOTOCONDUCTIVE ELEMENTS CONTAINING ALKALI-RELEASE MATERIALS
Lawrence E. Contois, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Sept. 2, 1969, Ser. No. 854,748
Int. Cl. G03g 5/06
U.S. Cl. 96—1.6 12 Claims

Electrophotographic elements containing alkali-release materials admixed with photoconductive compositions are described. When these elements are developed and heated, the alkali-release materials generate alkaline products which cause a shift in the absorption of the sensitizers contained in the photoconductive compositions. Such a shift generally reduces the optical opacity of the elements, thus permitting the elements to be used as masters from which further reprints can be made.

3,671,234
PROCESS OF FORMING AN ELECTROPHOTOGRAPHIC ELEMENT
George D. Casavant, Gansevoort, N.Y., assignor to International Paper Company, New York, N.Y.
Continuation of abandoned application Ser. No. 684,587, Nov. 2, 1967. This application Feb. 8, 1971, Ser. No. 113,753
Int. Cl. G03g 5/08
U.S. Cl. 96—1.8 2 Claims

A process, and the products thereof, for improving the dispersion of a pigment in resin binders in the manufacture of electrophotoconductive recording elements used in electrophotography by regulating the temperature and the addition of ingredients during such dispersion.

3,671,235

C_6 TO C_{18} ALIPHATIC ALCOHOLS USED AS DEFOAMING AGENTS IN ZINC OXIDE-RESIN DISPERSIONS

Narlo Yamaguchi, Sakae Shimizu, and Kazuo Tubuko, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 3, 1968, Ser. No. 780,786
Claims priority, application Japan, Dec. 12, 1967, 42/79,632
Int. Cl. G03g 5/08
U.S. Cl. 96—1.8 3 Claims

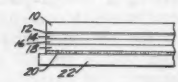
A light sensitive material for electrophotography comprising a base material and a light sensitive layer provided thereon, in which the light sensitive layer comprises a water soluble resin and an aliphatic alcohol having a defoaming characteristic and which has the function of improving the electrophotographic characteristics.

3,671,236

PRESENSITIZED COLOR-PROOFING SHEET

Philip C. Van Beusekom, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 18, 1968, Ser. No. 713,836
Int. Cl. G03c 1/52, 7/16; G03f 5/18
U.S. Cl. 96—15 8 Claims



A light-sensitive color-proofing sheet for producing an image on various substrates. A light-sensitive continuous color layer is releasably attached to a carrier. Overlying the color layer is a water-insoluble transparent colorless barrier layer, to the opposite surface of which can be applied a pressure-sensitive adhesive. Upon lamination of the sheet to a substrate, and removal of the carrier, the color layer is formed into an image, photomechanically, by removal thereof in the non-image areas. Preferably the color coating is a pigmented polyvinyl formal resin, the light-sensitive component is a diazo resin (which may be in a separate coating or combined with the polyvinyl formal) and the barrier is a polyacrylate polymer.

3,671,237

METHOD FOR PRODUCING IMAGES

Werner Erwin Louis Haas and James Ewing Adams, Webster, and Bela Mechlowitz, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 9, 1969, Ser. No. 831,449
Int. Cl. G03c 5/04
U.S. Cl. 96—27 1 Claim

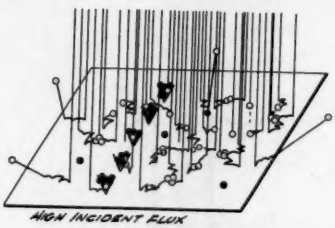
Method and apparatus for producing an image wherein a layer of radiation absorbing particles is caused to differentially adhere to the surface of a substrate in an imagewise pattern in areas of the layer exposed to radiation.

3,671,238

HIGH CONTRAST IMAGE DEVELOPMENT METHOD AND ARTICLE

Alfred F. Kaspaul and Erika E. Kaspaul, Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 10, 1970, Ser. No. 71,043
Int. Cl. G03g 5/02
U.S. Cl. 96—27 8 Claims



Methods for improving the contrast of images formed by depositing metal vapor atoms on actinic ray imagewise-exposed nucleated surfaces of nucleation recording medium and article produced thereby. Optical densities of over 2.0 are obtained by suitable moderation of the thermal energy of the vapor atoms such that the atoms form an amorphous image film which exhibits low specular reflectance. Moderation is achieved by use of low temperature and/or large area vapor sources, chemical interactions with the source or energy exchange between the vapor atoms and secondary gases or wall surfaces within the developing chamber.

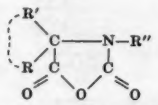
3,671,239

PHOTODECOMPOSITION OF OXAZOLIDINEDIONES AND SIMILAR ANHYDRIDES

Arnold Zweig, Westport, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 12, 1971, Ser. No. 105,978
Int. Cl. G03c 1/52
U.S. Cl. 96—27 R 4 Claims

A system for storage of information and color photography comprising the use of a dye precursor capable of photochemical conversion to a permanent visible image under light of a particular wavelength, or heat, is provided, said material being an anhydride compound of the formula:



wherein R and R' each represent hydrogen, phenyl or substituted phenyl, or taken together represent a spirolinked fluorenyl, naphthyl, or pyrozalyl substituent, and R'' represents hydrogen, phenyl or substituted phenyl.

3,671,240

PHOTOGRAPHIC TRANSFER ELEMENTS AND PROCESSES FOR PREPARING AND USING THEM

Eugene P. Gramza and David D. Schreiber, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 10, 1970, Ser. No. 45,219
Int. Cl. G03c 5/54, 1/68
U.S. Cl. 96—29 R 32 Claims

Photosensitive elements for use in image transfer processes contain in the light sensitive layer a flocculated pigment which forms a discontinuous phase uniformly distributed in a continuous polymer layer. The light sensitive layer can be prepared by mixing and coating a solution

of the light sensitive polymer and a pigment with a surfactant to flocculate the pigment. The resultant element can be used in photothermographic image transfer processes to give images having increased transfer density.

3,671,241

DIFFUSION TRANSFER IMAGE RECEIVING SHEET WITH HYDROLYZED POLYMER LAYER

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 437,799, Mar. 8, 1965. This application Oct. 16, 1967, Ser. No. 675,472

Int. Cl. G03c 5/54

U.S. Cl. 96—29 **15 Claims**

The present invention relates to photography and, more particularly, to specified photographic diffusion transfer process image-receiving elements which include a polymeric strata having associated therewith silver precipitating agent, and to specified processes for the production of and the employment of such image-receiving elements.

3,671,242

SILVER SALT DIFFUSION PROCESS

Werner Liebe, Siegfried Petersen, and Anita von Konig, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 30, 1969, Ser. No. 889,352

Claims priority, application Germany, Jan. 25, 1969, D 19 03 741.3

Int. Cl. G03c 5/54

U.S. Cl. 96—29 **2 Claims**

The image tone of silver images produced by the silver salt diffusion process is unproved by performing the development in the presence of 1,2,4-triazine blue toners.

3,671,243

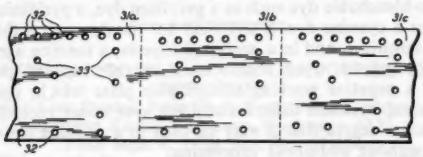
MASK REGISTRATION DURING CONTINUOUS PHOTOETCHING OF STRIP MATERIAL

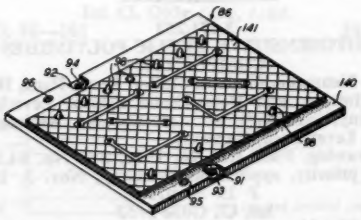
Douglas E. Campbell and Richard A. Harris, Greensboro, N.C., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 26, 1970, Ser. No. 83,915

Int. Cl. G03c 5/00

U.S. Cl. 96—36.2 **3 Claims**





Printed circuits are made from a strip of insulative material having metal films bonded on opposite sides thereof. Holes are punched in successive sections of the strip to receive component leads or to provide a path for an electrical connection between circuits on opposite sides of the board. The metal films are covered with a radiant energy sensitive resist and the resist covered strip is moved continuously past a first radiant energy source adjacent a first side of the strip and past a second radiant energy source adjacent the second side of the strip. A plurality of individual masks are brought into successive engagement with the first side of the strip such that a single mask is in registration with each section as the section passes the first radiant energy source. A second plurality of individual masks are brought into successive engagement with the second side of the strip such that a single mask is in registration with each section as the strip passes the second radiant energy source. The resist material is then developed and the metal coating is etched to produce the desired circuit pattern. Electrical connections may then be formed through holes connecting circuit patterns on opposite sides of the strip.

3,671,244

PROCESS FOR FORMING DYE IMAGES

Vernon L. Bissonette, Brockport, N.Y., and Jerry B. Miller, deceased, late of Webster, N.Y., by Carol K. Miller, executrix, Webster, N.Y.; said Bissonette assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 23, 1970, Ser. No. 31,352

Int. Cl. G03c 7/00

U.S. Cl. 96—54 **19 Claims**

Formazan dye image densities formed by treating a photographic metal image in a hydrophilic colloid binder layer with a tetrazolium salt solution in the presence of a metal complexing ligand are enhanced by the presence in said binder layer of at least one terpolymer containing about 0.1% by weight of active methylene groups in aliphatic side chains in which the methylene groups are usually separated from the main polymer chain by at least three carbon atoms, the terpolymers being formed of an alkyl acylate or an alkyl methacrylate as one monomer, either a salt of a sulfoalkyl acrylate, a salt of a sulfoalkyl alkacrylate, acrylic acid (or salt) or an alkacrylic acid (or salt) as a second monomer, and either a cyanoacetoxyalkyl acrylate, a cyanoacetoxyalkyl alkacrylate, an acyl substituted acetoxyalkyl acrylate or an acyl substituted acetoxyalkyl alkacrylate as the third monomer.

3,671,245

IMAGEWISE HARDENING DIRECT-WRITING PHOTODEVELOPED SILVER HALIDE EMULSION

Glenn Duane Stone, South Amboy, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 24, 1969, Ser. No. 879,555

Int. Cl. G03c 5/24

U.S. Cl. 96—64 **5 Claims**

A direct writing silver halide emulsion in an unhardened colloid binder containing a tanning developing agent provides advantageous intensification and stabilization of a photodeveloped image.

A process of stabilizing direct writing images comprising developing an unhardened direct writing emulsion after imagewise exposure and photodevelopment in the presence of at least one tanning developer, followed by washing with hot water.

3,671,246

EXTENDED DYNAMIC RANGE PHOTOGRAPHIC PROCESSING

Leo D. Corben, Swampscott, William T. Kammerer, Towsend, and Allan Shepp, Lexington, Mass., assignors to the United States of America as represented by the Secretary of the Air Force

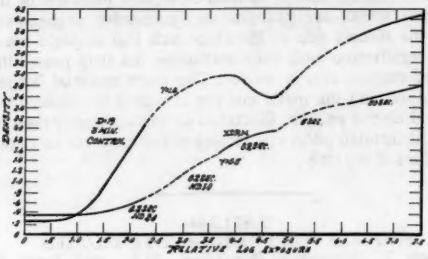
Filed Oct. 22, 1968, Ser. No. 769,761

Int. Cl. G03c 5/24, 5/26, 5/30

U.S. Cl. 96—66 **6 Claims**

A method for extended dynamic range processing of photographic film in which the exposed film is weakly

developed in a dilute solution of surface developer. The emulsion surface of the film is then bleached with a dilute solution of bleach for a short period of time and cleared with a salt solution. The emulsion is then developed with full strength photographic developer and stopped fixed, washed, and dried in the conventional manner to produce a negative having an extension of the exposure latitude of the film from 3 orders to about 6 orders.



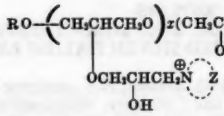
3,671,247

DEVELOPMENT OF SILVER HALIDE PHOTOGRAPHIC MATERIALS

Masakazu Yoneyama, Isao Shimamura, Haruhiko Iwano, and Reiichi Ohi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Oct. 22, 1970, Ser. No. 83,208
Claims priority, application Japan, Oct. 22, 1969, 44/84,536
Int. Cl. G03c *5/30*
U.S. Cl. 96—66.3 9 Claims

A method for the development of silver halide photographic light-sensitive materials, which comprises developing a silver halide photographic material in the presence of a compound represented by the following general formula



in which R is selected from the group consisting of a hydrogen atom and R'CO—, wherein R' is selected from the group consisting of a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group and a substituted aryl group, wherein $x+y$ is a number ranging from 3 to 50, X represents an anion, and Z represents an atomic group necessary for completing a heterocyclic ring, is disclosed.

3,671,248

STAIN INHIBITOR IN PHOTOGRAPHIC PAPER BASES

Merle K. Eldridge and Roy C. Bloom, Hilton, and Douglas C. Joseph, Victor, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 10, 1970, Ser. No. 44,965
Int. Cl. G03c *1/48, 1/86*
U.S. Cl. 96—76 R 7 Claims

Photographic elements having polyolefin coated paper supports, provided with silver halide emulsion layers containing silver halide developing agents, with or without hydrophilic backing layers, exhibit stain due to migration of the developing agent to paper and to the backing layer. Stain is avoided by sizing the paper with an aldehyde bisulfite and coating any backing layer at a pH less than 7 preferably about 3 to 4.

3,671,249

PHOTOSENSITIVE CUPROUS NITRATE COMPOSITIONS AND PROCESS FOR PREPARING AND USING SAME

Thomas E. Flynn, 95 Court St., Portsmouth, N.H. 03801

No Drawing. Filed Mar. 20, 1970, Ser. No. 21,492
Int. Cl. G03c *1/00*
U.S. Cl. 96—88 10 Claims

Photosensitive compositions containing cuprous compounds, particularly cuprous nitrate, as the photosensitive component are prepared. The compositions are used in photographic materials and processes to provide copper images.

3,671,250

BIPYRIDINIUM COMPOUND PHOTOSENSITIZER

Timothy Douglas Andrews and Glyn David Short, Northwich, and Ieuan Thomas, Frodsham, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed June 29, 1970, Ser. No. 50,910
Claims priority, application Great Britain, May 28, 1969, 26,925/69; Sept. 12, 1969, 45,151/69; Nov. 24, 1969, 57,392/69
Int. Cl. G03c *1/00, 1/68*
U.S. Cl. 96—88 11 Claims

A radiation sensitive material based on nitrogenous dications such as bipyridyls, preferably with a water soluble polymer as a support. Sensitisers and desensitisers are decribed. The materials are sensitive to X-rays, electrons and U.V. up to about 500 nm., in the presence of sensitisers.

3,671,251

SENSITIZED PYRYLIUM PHOTOBLEACHABLE DYE IN GELATIN

Conrad G. Houle, Webster, and Thomas J. Masseth, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 10, 1970, Ser. No. 97,049
Int. Cl. G03c *1/72*
U.S. Cl. 96—89 16 Claims

A light sensitive layer comprising a gelatin binder, a photo-bleachable dye such as a pyrylium dye, a pyridinium dye or a cyanine dye, a sensitizer for the dye e.g., a thiourea sensitizer, and in a preferred aspects, a tanning agent for the gelatin, when coated on a suitable support, provides a negative working lithographic plate which, upon exposure, becomes differentially ink and water receptive to such a degree that it may be used in a printing operation without additional processing.

3,671,252

PHOTOSENSITIVE CYCLIC POLYIMIDES COMPOSITION

Wolfram Neumann, Gerhard Muller, Erwin Ranz, Harald von Rintelen, and Heinz-Dieter Schutz, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 26, 1970, Ser. No. 84,196
Claims priority, application Germany, Nov. 3, 1969, P 19 55 070.0
Int. Cl. G03c *1/52*
U.S. Cl. 96—90 5 Claims

A photographic material free from silver halide containing cyclic polyimides as photosensitive compounds which are converted into dark-coloured substances under the effect of light. An image formed during exposure of the recording material according to the invention can be erased spontaneously or by additional specific measures so that the material can be re-used.

3,671,253

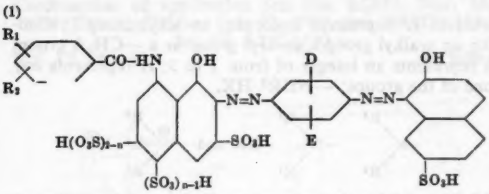
PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL ESPECIALLY FOR THE SILVER-DYESTUFF BLEACHING PROCESS

Alfred Froehlich, Marly-le-Grand, Bernhard Piller, Marly-le-Petit, and Thomas Stauner, Marly-le-Grand, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,952
Claims priority, application Switzerland, Mar. 25, 1969, 4,477/69
Int. Cl. G03c 1/10
U.S. Cl. 96—99 14 Claims

Photographic light-sensitive material, especially for the silver dyestuff bleaching process, is provided, which contains on a support at least one layer with at least one dyestuff of the formula

(I)



in which R_1 represents a methoxy group, a hydrogen or halogen atom, R_2 represents a halogen atom or a methyl, methoxy, nitrile, trifluoromethyl, nitro, W—CO—, X—CO—NH—, Y—SO_2—NH— or Z—SO_2— group, with W representing a hydroxyl, lower alkyl, lower alkoxy or optionally substituted phenyl group, X representing a hydrogen atom, or a hydroxyl, HOOC-alkylene, HOOC-alkenylene, phenyl, HOOC-phenylene, HO_3S-phenylene, furyl, thienyl or pyridyl group, Y representing a lower alkyl, phenyl, alkylphenylene or HOOC-phenylene group and Z representing a lower alkyl, a phenyl or an optionally substituted amino group, D and E independently of one another each denote a hydrogen or chlorine atom or a methyl, methoxy, ethoxy or hydroxyethoxy group, and *n* denotes 1 or 2.

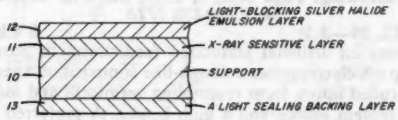
These dyestuffs at the same time have excellent resistence to diffusion, form stable aqueous solutions, are insensitive to calcium ions, can be easily bleached, and have favorable spectral properties.

3,671,254

RADIOGRAPHIC ELEMENTS, COMPOUNDS AND PROCESSES

Claude Guy Dostes, Joinville-le-Pont, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,644
Claims priority, application France, May 29, 1970, 7019684
Int. Cl. G03c 1/36, 1/84
U.S. Cl. 96—101 23 Claims



A roomlight handling radiographic element or emulsion wherein the light-sensitive layer or layers thereof are protected from exposure to visible light; said element or emulsion comprising an X-ray-sensitive silver halide layer comprising a silver halide desensitizing compound such as a nitrothiazolinothiacyanine and a yellow dye, and coated upon said X-ray-sensitive layers a light-absorbing silver halide layer comprising a nitrogen-containing heterocyclic silver halide desensitizing compound and a yellow dye such as a phenylazopyrazol-5-one yellow dye. Processes for obtaining a radiographic image employing the roomlight handling radiographic elements and emulsions are disclosed.

Electromagnetic radiation-sensitive silver halide desensitized with a nitrothiazolinothiacyanine or containing a phenylazopyrazol-5-one yellow dye.

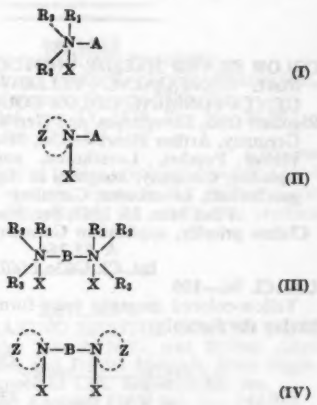
3,671,255

SILVER HALIDE EMULSION FOG INHIBITED WITH QUATERNARY AMMONIUM, TRIAZOLE AND TETRAZAINDENE COMPOUNDS

Teruhide Haga, Hisashi Yamaguchi, and Yotaro Hirao, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Aug. 21, 1970, Ser. No. 66,141
Claims priority, application Japan, Aug. 28, 1969, 44/67,624
Int. Cl. G03c 1/34
U.S. Cl. 96—109 5 Claims

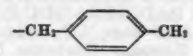
A light-sensitive silver halide photographic material, especially suited for quick development, contains as antifoggants at least one of the compounds represented by the general Formulas I, II, III and IV



wherein R_1 and R_2 are individually an alkyl or hydroxyalkyl group having 1 to 18 carbon atoms; R_3 is an alkyl or hydroxyalkyl group having 1 to 18 carbon atoms, or an aryl or aralkyl group; Z is a non-metallic atomic group necessary for formation of hetero ring by bonding to the nitrogen atom; A is an alkyl, alkenyl, aryl or aralkyl group; B is

$$-(CH_2)_n-$$

$$-CH_2O(CH_2)_nOCH_2-$$



$$-CH_2-O-CH_2-$$

$$-CH_2\cdot CH_2-S-CH_2\cdot CH_2-$$

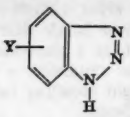
$$-CH_2\cdot OCH_2-S-CH_2\cdot CH_2\cdot O\cdot CH_2-$$

or

$$-CH_2\cdot CO\cdot CO\cdot CH_2-$$

(where *n* is a positive integer of 1 to 10); and X is an anion, combined with 4-hydroxy-6-methyl-1,3,3a,7-tetra-

zaindene in at least one layer of the photographic material. A compound of the general formula



where Y is a hydrogen atom, a nitro group, a halogen atom or a methyl group, is further incorporated as third component.

3,671,256

POLYMERIC HARDENERS CONTAINING AZIRIDINYL UNITS ON THE SIDE CHAIN

Louis Morton Minsk and Hyman L. Cohen, Rochester, N.Y., and Elliott Frauenglass, Newington, Conn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,249
Int. Cl. G03c 1/30
U.S. Cl. 96—111 8 Claims

New high molecular weight linear addition polymers are provided comprising a main chain of a linear saturated substituent and a side chain of aziridinyl units separated from said main chain by a carbamyl, carbonyl or an alkylene ester group. When incorporated into photographic elements and emulsions said polymers are substantially safe and effective hardeners for hydrophilic colloids used therein as vehicles or binders and do not exhibit unwanted sensitometric effects.

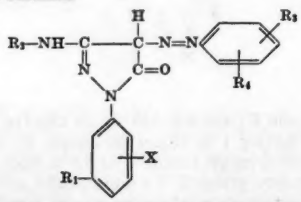
3,671,257

COLOR SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING YELLOW-COLORED MAGENTA-FORMING COLOR COUPLER

Rigobert Otto, Leverkusen, and Gerrit Pankow, Opladen, Germany, Arthur Henri de Cat, Mortsel, Belgium, and Walter Puschel, Leverkusen, and Willibald Pelz, Opladen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 20, 1968, Ser. No. 714,525
Claims priority, application Germany, Mar. 25, 1967, A 55,264
Int. Cl. G03c 1/40
U.S. Cl. 96—100 4 Claims

Yellow-colored magenta color-forming color couplers having the formula



make very effective integral masks that compensate undesired blue side absorption of the magenta image.

3,671,258

SPEED INCREASING COMBINATION OF STABILIZERS FOR RADIOGRAPHIC ELEMENTS

Robert C. Taber, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Jan. 11, 1971, Ser. No. 105,636
Int. Cl. G03c 1/28
U.S. Cl. 96—107 19 Claims

A radiographic element, which comprises a support having thereon at least one silver halide layer, wherein said halide comprises at least about 50 mole percent chloride, a sulfocatechol and a tetrazaindene, shows an increase in speed. In a preferred embodiment said element has a total silver coverage of at least about 100 mg. per square foot per silver halide layer.

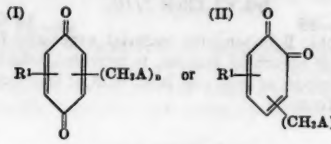
3,671,259

PHOTOGRAPHIC BLEACHING AND ANTIFOGGING AGENTS

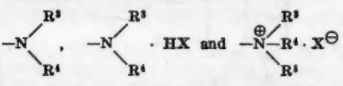
Bernard C. Cossar, Pittsford, and Delbert D. Reynolds, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 31, 1970, Ser. No. 103,288
Int. Cl. G03c 1/34
U.S. Cl. 96—109 9 Claims

Aminomethylquinones and salts thereof having the general formula:



wherein R^1 represents hydrogen, an alkyl group (including an aralkyl group), an aryl group or a $—CH_2A$ group; *n* represents an integer of from 1 to 3; A represents any one of the groups: $—NHR^2 \cdot HX$,



R^2, R^3 and R^4 each represent an alkyl group (including an aralkyl group), an alkenyl group, an aryl group, etc. or R^3 and R^4 when taken in combination with the nitrogen atom to which they are attached represent a monovalent, heterocyclic group; R^5 represents an alkyl group including an aralkyl group; and X represents an anion; with the provision that each $—(CH_2A)$ group is substituted at a position ortho to an oxo group on the quinone ring; are useful as bleaching agents and as fog inhibiting agents.

3,671,260

ORGANIC THIOETHER OR SELENOETHER SILVER COMPLEXES AS EMULSION SENSITIZERS

Edwin N. Oftedahl, Rochester, Thomas J. Huttemann, Jr., Henrietta, and Charles A. Goffe, Brockport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Jan. 14, 1971, Ser. No. 106,531
Int. Cl. G03c 1/28
U.S. Cl. 96—122 11 Claims

Photographic silver bromoiodide emulsions are spectrally sensitized by adding thereto a mixture comprising a photographic spectral sensitizing dye and a complex of silver with an organic thioether or an organic selenoether.

Addition of the silver complex reduces the blue desensitization caused by the sensitizing dye and thus increases spectral sensitization efficiency. Incubation stability of the emulsion is also enhanced.

3,671,261

ARTIFICIAL SHRIMP FEED

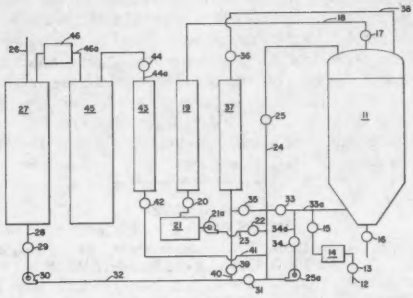
Yaichi Ayukawa, Uhei Naruse, Tadayoshi Itoh, and Tsuneaki Miyakawa, Tokyo, Japan, assignors to CPC International Inc.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,363
Int. Cl. A23k 1/18
U.S. Cl. 99—2 R 8 Claims

Covers an artificial texturized feed useful in growing shrimp which comprises a dough-like composition kneaded or extruded into a form resembling vermicelli and including a protein source and a gum binder. A preferred protein source is corn gluten, and a preferred gum binder is a starch gum. A particularly useful feed contains corn gluten, starch gum and yeast, and may contain other ingredients, particularly other protein sources. The feed is of a form resembling vermicelli or spaghetti and is of a size large enough to be noticed by the shrimp when feeding, and yet of a size sufficiently small so that the shrimp

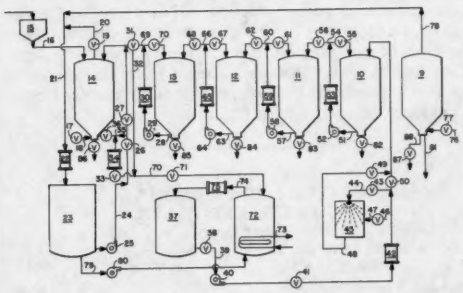
can still clutch it. It is greatly preferred that the shrimp feed be in the form of rounded pieces which have been extruded or kneaded to a length of about 4.0–6.0 mm. and a diameter of 1.0–3.0 mm. The shrimp feed provides a food of an excellent low conversion ratio, and does not cause contamination or pollution of the culture water or sand bed due to its particular configuration and relative water-insolubility.

3,671,262
DECAFFEINATION PROCESS
Alan B. Wolfson, Springfield Township, Hamilton County, Jayantilal M. Patel, Reading, and Benjamin Lawrence, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of application Ser. No. 23,653, Mar. 30, 1970. This application Feb. 23, 1971, Ser. No. 118,183
Int. Cl. A23f *1/10*
U.S. Cl. 99—70 **6 Claims**



Decaffeination total process times and caffeine extraction times are substantially reduced by utilizing a high caffeine solvent velocity and a high exchange rate of solvent with respect to green coffee beans.

3,671,263
SEMI-CONTINUOUS COUNTERCURRENT DECAFFEINATION PROCESS
Jayantilal M. Patel, Reading, and Alan B. Wolfson, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of abandoned application Ser. No. 23,652, Mar. 30, 1970. This application Feb. 23, 1971, Ser. No. 118,184
Int. Cl. A23f *1/10*
U.S. Cl. 99—70 **9 Claims**



A semi-continuous staged countercurrent extraction process involving high extraction temperatures, high prewetting moisture, high solvent exchange rates, and high solvent superficial velocity is used to substantially decrease caffeine extracting process times.

ERRATUM

For Class 99—92 see:
Patent No. 3,670,665

3,671,264
PACKAGED MIXES FOR FLAVORED FOOD PRODUCTS AND THE PROCESS OF MAKING THEM
Harvey J. Drews and Stanley P. Raffensperger, Knoxville, Tenn., assignors to The White Lily Foods Company, Knoxville, Tenn.
No Drawing. Filed May 4, 1970, Ser. No. 34,633
Int. Cl. A23l *1/00, 1/26;* A21d *2/00*
U.S. Cl. 99—94 **14 Claims**

Packaged dry mixes containing artificially flavored lumps in which the major ingredients functioning in the formation and texture of the lumps are high melting point hydrogenated vegetable fat, pregelatinized starch, sucrose and dextrose. The lumps are formed by blending and extrusion. The lumps are added to and packaged in combination with various dry mixes which can be stored at normal ranges of temperature and humidity for relatively long periods of time.

3,671,265
RAISIN COLORING PROCESS
Donald L. Maxwell and Philip E. Nyberg, Minneapolis, Minn., assignors to General Mills, Inc.
No Drawing. Filed Apr. 13, 1970, Ser. No. 28,027
Int. Cl. A23l *1/27*
U.S. Cl. 99—104 **6 Claims**

A process for coloring raisins involving dissolving food colorings in ethyl alcohols, exposing the raisins to the solution and then manipulating the reaction to produce the color desired.

3,671,266
PROCESS FOR MAKING HEXITOL COATED NUTS
Irwin Cooper, Staten Island, N.Y., and Wilbur Allen Parker, Somerville, and Daniel Melnick, West Englewood, N.J., assignors to CPC International Inc.
No Drawing. Filed Aug. 29, 1969, Ser. No. 854,261
Int. Cl. A23l *1/36*
U.S. Cl. 99—126 **30 Claims**

A process for producing a hexitol coated nut product comprising providing hexitol coated raw nuts, roasting the nuts in a hot gaseous environment, cooling the roasted nuts, and recovering the coated nut product.

3,671,267
PEANUT BUTTER
Chester Martin Gooding, Westfield, Wilbur Parker, Somerville, and Daniel Melnick, West Englewood, N.J., assignors to CPC International Inc.
No Drawing. Filed June 30, 1969, Ser. No. 837,862
Int. Cl. A23l *1/38*
U.S. Cl. 99—128 **17 Claims**

A peanut butter of improved mouth feel and low temperature spreadability, stabilized against oil separation at temperatures up to about 100° F. with from about 0.5% to about 2.3% of a symmetrical monounsaturated disaturated glyceride, from about 0.35% to about 1.3% of a trisaturated glyceride, and no more than about 2% total of a diunsaturated monosaturated glyceride and/or unsymmetrical monounsaturated disaturated glyceride, the percentage figures being percent by weight.

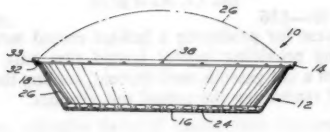
3,671,268
ICE-CREAM PRODUCTS
Anthony Blake, Ravensden, Bedford, and Denis Malcolm Halliday, Lavendon, and Michael Faulkner Woods, Stevington, England, assignors to Lever Brothers Company, New York, N.Y.
Filed Oct. 30, 1969, Ser. No. 872,612
Claims priority, application Great Britain, Nov. 1, 1968, 51,957/68; Mar. 26, 1969, 15,881/69
Int. Cl. A23g 5/00; A23l 1/06
U.S. Cl. 99—136 7 Claims

A variegated ice-cream product is produced by incorporating discrete pieces of a gelled fruit puree into ice-cream, water ice, mousse or sorbet. The gelled fruit puree may be set by cooling in a tube and extruded directly into the ice-cream mix, or may be set in bulk and pumped into the ice-cream mix by a pump which shreds the gel.

3,671,269
PROCESS OF PREPARING PUDDINGS CONTAINING STARCH HAVING A LOW BOUND-FAT CONTENT
Felix J. Germino, Palos Park, and Joseph R. Caracci, Jr., Chicago, Ill., assignors to CPC International Inc.
No Drawing. Original application June 12, 1967, Ser. No. 645,527, now Patent No. 3,586,536. Divided and this application May 6, 1970, Ser. No. 47,931
Int. Cl. A23l 1/14
U.S. Cl. 99—139 4 Claims

Preparation of puddings by cooking together a mixture of milk, a sweetener, flavoring agent and starch, said starch being prepared by reducing the bound fat content of granular starch to not more than 0.15% by weight by heating a mixture of the starch, a suitable solvent, and not more than 15% water, in a confined zone, at from about 225° F. to about 300° F. for not more than 30 minutes, the conditions being selected so as to avoid incipient gelatinization of the starch. Starch treated in accordance with the process which is further characterized by a fluidity of from about 30 to about 80.

3,671,270
POPCORN PACKAGE
David H. Jehn, Warren, Mich., assignor to Dun-Hot, Incorporated, St. Clair Shores, Mich.
Filed Aug. 19, 1970, Ser. No. 65,012
Int. Cl. B65b 25/22
U.S. Cl. 99—171 H 5 Claims

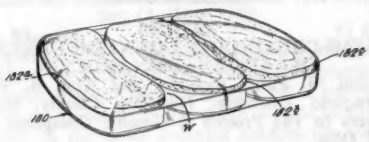


The popcorn package includes an open-topped relatively shallow pan which has an annular flange. A transparent plastic cover extends across and into the pan. The cover has substantially the same relatively shallow outline as the pan. This permits nesting of a plurality of popcorn packages for storage purposes. A charge of popcorn kernels and cooking oil is confined between the pan and the cover. The cover is outwardly flexible upon heating of the charge to pop the corn. The flange includes a bent over edge portion which clampingly engages the marginal peripheral edge of the flexible cover. A plurality of spaced apart staked portions in the flange, which puncture both the flange and the marginal edge of the cover, positively hold the cover in place and provide a restricted fluid passage for pressure release during heating of the charge to pop the popcorn kernels.

3,671,271
PACKAGE FOR SLICED BACON
Harmon B. Miller, Atlanta, Ga., assignor to Reclosable Package Corp., Atlanta, Ga.
Filed Feb. 26, 1969, Ser. No. 802,491
Int. Cl. B65b 25/06
U.S. Cl. 99—174 8 Claims

A package for bacon slices and slices of other kinds of luncheon meat comprising a corrugated plastic tray having across its surface alternating elongated ribs and grooves. The slices are placed against the corrugations with one edge adjacent the corrugations and the other edge extending outwardly so that the slices are inclined with respect to the tray. The outwardly extending edges of the respective slices are in overlapping contact with adjacent slices. The edges adjacent the tray are spaced from each other and are free to move into the grooves of the corrugations. This reduces the area of contact between adjacent slices and makes it easier to separate the slices.

3,671,272
FROZEN MEAT PACKAGE
George A. Mixon, Fort Lauderdale, Fla., assignor to Mol-Pak Corp., Fort Lauderdale, Fla.
Application Oct. 25, 1968, Ser. No. 770,530, now Patent No. 3,526,077, dated Sept. 1, 1970, which is a continuation-in-part of application Ser. No. 479,949, Aug. 16, 1965. Divided and this application May 1, 1970, Ser. No. 33,813
Int. Cl. A23b 1/06; B65b 25/06
U.S. Cl. 99—194 2 Claims

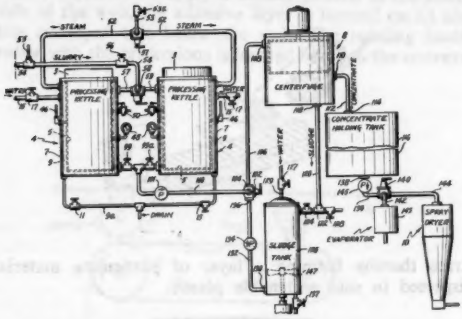


A tray or container for meat products made of a translucent material comprising at least one cavity section for a cut of meat, said cavity section including a base portion conforming generally to the periphery of the meat product, an upstanding peripheral sidewall at a height slightly less than the thickness of the meat product, means defining a plurality of annular ribs in the base defining continuous spaced apart channels for meat juices and an overwrap of a transparent heat shrinkable filmy material covering at least the open side of the tray.

3,671,273
APPARATUS FOR PREPARING A COCOA CONCENTRATE
Alec C. Gunter, Clear Brook, Va. 22624
Filed May 20, 1968, Ser. No. 730,359
Int. Cl. A23g 1/00, 1/04, 7/00
U.S. Cl. 99—236 CC 8 Claims

A cocoa concentrate for making sediment-free chocolate beverages is prepared with an apparatus comprising means for heating a slurry to a temperature higher than the boiling temperature of water; a processing kettle to

receive the slurry from the heating means and constructed to subject the slurry to heating under pressure and agitation, and to cool the heated slurry; and centrifuge means to receive the cooled slurry from the processing kettle.



3,671,274

BATHS FOR ACTIVATING THE SURFACE OF PLASTICS TO BE CHEMICALLY METAL-PLATED

Hiroshi Maekawa, Osaka, and Choji Yamauchi, Fuse, Japan; said Maekawa assignor to Giichi Okuno, Higashi-ku, Osaka-shi, Japan

No Drawing. Continuation-in-part of application Ser. No. 570,702, Aug. 8, 1966. This application May 6, 1970, Ser. No. 35,260
Claims priority, application Japan, Aug. 6, 1965, 40/47,912
Int. Cl. C23c *3/00*
U.S. Cl. 106—1 11 Claims

Plastic surface is activated for subsequent chemical metal plating by treatment with a solution containing, as essential ingredients, sulfuric acid, silver compound and metal halide, as optional ingredients, chrominum compound and phosphoric acid.

3,671,275

LOSSY DIELECTRIC STRUCTURE FOR DISSIPATING ELECTRICAL MICROWAVE ENERGY

Louis E. Gates, Jr., Inglewood, and William E. Lent, Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

No Drawing. Continuation-in-part of application Ser. No. 586,649, Oct. 14, 1966. This application Dec. 12, 1969, Ser. No. 884,715
Int. Cl. C04b *35/14*
U.S. Cl. 106—44 5 Claims

A lossy dielectric attenuator for receiving and dissipating high power wave energy on the order of 100 watts and more comprised of the combination of silicon carbide in an alumina matrix.

3,671,276

OPTICAL FLUOROPHOSPHATE GLASS HAVING AN ANOMALOUS PARTIAL DISPERSION RATIO

Heinz Bromer, Hermannstein, and Norbert Meinert, Wetzlar, Germany, assignors to Ernst Leitz GmbH

No Drawing. Continuation-in-part of application Ser. No. 603,978, Dec. 22, 1966. This application June 26, 1969, Ser. No. 836,965
Claims priority, application Germany, June 27, 1968, P 17 71 692.6
The portion of the term of the patent subsequent to Jan. 27, 1987, has been disclaimed
Int. Cl. C03c *3/00*
U.S. Cl. 106—47 Q 5 Claims

An optical glass having an anomalous partial dispersion ratio is disclosed which is melted from a mixture consisting essentially of about 58.6–73.8 mol percent of the fluorides of the alkaline-earth metals: magnesium, calcium, strontium and barium, further of about 5.9–21.8 mol percent of the metaphosphates of the alkaline-earth metals: magnesium, strontium, calcium, barium and of aluminum, about 6.3–7.6 mol percent of magnesium oxide and of at least one of the following compounds: $BaT:F_6$ and K_2TiF_6.

3,671,277

ULTRAVIOLET RAY CUTTING PINK GLASS FOR COLOR PHOTOGRAPHY

Masao Ohno, Kawasaki-shi, and Katsumi Kijima, Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 1, 1969, Ser. No. 862,770
Claims priority, application Japan, Oct. 8, 1968, 43/72,887
Int. Cl. C03c *3/04, 3/30;* F21v *9/00*
U.S. Cl. 106—47 Q 5 Claims

An ultraviolet ray cutting pink glass for color photography of this invention provides the absorption peak wavelength in the vicinity of 550 mμ while the ultraviolet ray cutting limit wavelength within the range from 380 mμ to 400 mμ. It does not bring about the solarization. Glass material contains at least cerium oxide and gold and the material is melted at a temperature ranging from 1350° to 1500° C., cooled with the temperature gradient from 10° C./h. to 25° C./h., and reheated for 5 to 50 hrs. at a temperature in the vicinity of the softening point of glass for coloring the same.

3,671,278

IRON-CONTAINING TITANIA-OPACIFIED PORCELAIN ENAMELS

Bernard J. Borowski, Cleveland, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

No Drawing. Filed June 5, 1970, Ser. No. 43,971
Int. Cl. C03c *5/02*
U.S. Cl. 106—48 2 Claims

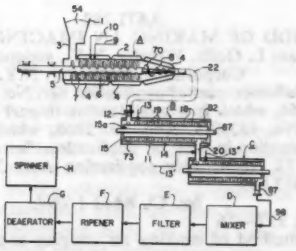
A porcelain enamel frit, containing a relatively high level of the oxide equivalent of iron, said frit adaptable to be incorporated into a vitreous porcelain enamel for application to an oven liner, said enamel characterized by the ability to oxidize oven soils when heated to a point above 350° F., but below 600° F., the method of utilizing same as a self-cleaning oven liner coating, and an oven liner coated therewith.

3,671,279

PROCESS FOR THE CONTINUOUS XANTHATION AND SOLUTION OF ALKALI CELLULOSE

Koichi Yasui, Kazuo Yamamoto, Kazuo Itami, and Kiyoshi Fujisawa, Miyazaki-ken, and Toshio Sasaki, Osaka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 13, 1970, Ser. No. 36,825
Claims priority, application Japan, May 13, 1969, 44/36,337; July 17, 1969, 44/56,298
Int. Cl. C08b *21/20*
U.S. Cl. 106—165 20 Claims



This invention relates to a continuous process for xanthate-formation from alkali cellulose, carbon disulfide

and aqueous alkali solution, as a preparatory step for the continuous manufacture of a ready-for-spinning viscose solution. This invention is characterized by that the alkali cellulose is precompressed, and added with aqueous alkali solution and carbon dioxide and the reaction mixture is kneaded in a series of two rotary type kneaders, in the first one of which only a presulfiding reaction is brought about and in the second kneader the remaining or main sulfiding reaction is carried out, the outlet from the second kneader being a dense paste having a soft cheese grade density comprising the xanthate as its main constituent.

3,671,280

PLASTER OF PARIS BANDAGES TO MAKE CASTS OF IMPROVED STRENGTH, WATER-RESISTANCE AND PHYSIOLOGICAL PROPERTIES

David F. Smith, 120 Grove St., Bay Head, N.J. 08742

No Drawing. Continuation-in-part of application Ser. No. 65,732, Aug. 20, 1970. This application Dec. 4, 1970, Ser. No. 95,365

Int. Cl. A61l *15/07;* **C04b** *11/16*

U.S. Cl. 106—116 **7 Claims**

Minor additions of polyvinyl pyrrolidone and melamine-formaldehyde resins to plaster of Paris bandages permit making "casts" of improved strength and water-resistance with good physiological properties.

3,671,281

PYRAZOLONE RED PIGMENT AND PROCESS THEREFOR

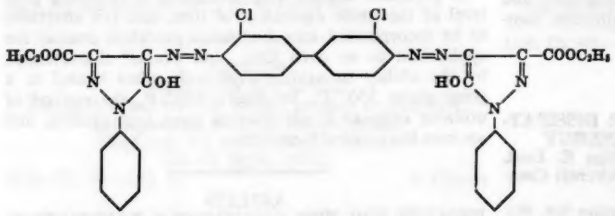
Nagib A. Doss, Loudonville, N.Y., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed Sept. 16, 1970, Ser. No. 72,844

Int. Cl. C08h *17/14*

U.S. Cl. 106—288 Q **5 Claims**

An improved red pigment is obtained by heating a commercially available pigment of the formula:



in an aromatic water-insoluble liquid boiling in a range of 80° to 250° C. for a period of about 0.75 to 12 hours and then stripping the liquid from the solid. The resultant pigment is bluer, brighter, stronger, and both more bleed resistant and thermally stable than the original pigment starting material. The improved pigment thus obtained is useful in rubber, plastics, printing inks, lacquers, paint emulsion and textile printing.

3,671,282

METHOD OF MAKING AN IMAGING MEMBER

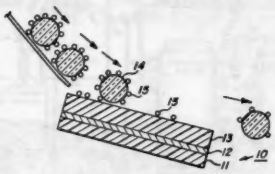
William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Continuation-in-part of application Ser. No. 570,996, Aug. 8, 1966, which is a continuation-in-part of application Ser. No. 483,675, Aug. 30, 1965, which in turn is a continuation-in-part of application Ser. No. 403,002, Oct. 12, 1964. This application Aug. 28, 1969, Ser. No. 853,869

Int. Cl. B44d *1/094*

U.S. Cl. 117—16 **34 Claims**

The method of making an imaging member comprising coating, preferably by cascading, a dispersed layer of particulate material over a softenable plastic substrate which is softened allowing the particulate material to embed below the surface of said softenable plastic substrate thereby forming a layer of particulate material dispersed in said softenable plastic.



3,671,283

EMBOSSED PLASTIC SURFACE COVERING AND METHOD OF PREPARING SAME

Richard P. Crowley, 125 High St., Wellesley Hills, Mass. 02110

No Drawing. Filed June 3, 1970, Ser. No. 43,223

Int. Cl. B44d *1/14;* **B32b** *3/30*

U.S. Cl. 117—9 **9 Claims**

A chemically embossed vinyl chloride resin sheet material is prepared by treating the gelled surface of a vinyl chloride resin plastisol containing a blowing agent with an aqueous latex of a vinyl chloride resin, whereby on subsequent heating of the treated gelled vinyl chloride resin sheet material to decompose the blowing agent and drive off the water of the latex, full expansion of the sheet material is prevented by the increase in resin content in the treated areas, thereby producing a chemically embossed product.

3,671,284

PROCESS AND APPARATUS FOR APPLYING ADHESIVE POINTS TO A WEB OR SHEET IN A DESIRED PATTERN

Wilhelm Uhrig, Wuppertal-Elberfeld, Germany, assignor to Dr. Plate GmbH, Bonn, Germany

Filed Jan. 16, 1970, Ser. No. 3,300

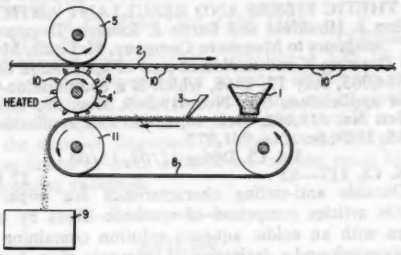
Claims priority, application Germany, Jan. 18, 1969, P 19 02 506.0

Int. Cl. B44d *1/094*

U.S. Cl. 117—21 **1 Claim**

A process is provided for applying a desired pattern of adhesive areas or points to a moving web by arranging a layer of powdered thermosetting plastic adhesive material on the moving web and thereafter contacting a pattern of heated projections with the adhesive to melt or sinter the same at the points of contact. The excess and unheated powdered adhesive is removed by suction. The result is a pattern, such as a screen-like arrangement, of adhesive points on the web so that it may be bonded to another web or sheet by compression. The pattern is formed by a rotating heated roller having projections on its periphery, the ends of the projections successively contacting the adhesive layer on the moving web. The adhesive in contact with the ends melts and the remaining unheated

powdered adhesive is removed by suction nozzle means to thereby provide the web with a screen-like pattern of adhesive points. To apply a similar pattern to the underside of the web, the adhesive layer is formed on an endless conveyor belt below the web. The rotating heated roller with the projections is located between the conveyor



belt and the bottom of the moving web. As the roller rotates, the ends of the projections contact and melt the adhesive material and thereafter transfer the molten globules of adhesive to the bottom of the web to thereby form a screen-like pattern of adhesive points on the bottom or underside of the web.

3,671,285

COMPOSITES AND INTERMEDIATES THEREFOR

Roger Prescott, Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,283
Int. Cl. C08j *1/02*; C09c *1/46*
U.S. Cl. 117—75 **6 Claims**

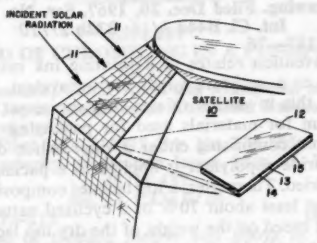
Composites, preimpregnated tapes, and sized-carbon fiber, prepared by coating carbon fibers with a high cross-section metal or metalloid and resin then curing the resin while irradiating the fiber with a source of thermal neutrons, improves bonding between resin and fiber.

3,671,286

SURFACE WITH LOW ABSORPTIVITY TO EMISSIVITY RATIO

Robert E. Fischell, Silver Spring, Md., assignor to the United States of America as represented by the Secretary of the Navy

Continuation-in-part of application Ser. No. 576,796, Aug. 31, 1966. This application Apr. 3, 1970, Ser. No. 25,482
Int. Cl. B64g *1/10*
U.S. Cl. 117—333 **5 Claims**



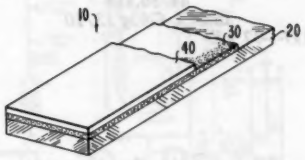
A thermal surface particularly adapted for use as the exterior coating of a space vehicle or the like, and exhibiting a very low absorptivity to emissivity ratio is formed by coating a layer of material, such as glass, having a high infrared emissivity with a dielectric low-pass optical filter material effective to reflect, with minimum absorption, a substantial portion of the incident solar radiation occurring at wavelengths shorter than a predetermined value and with a second material which complements the low-pass optical filter; i.e., it has low absorptivity for and is highly reflective to the remaining portion of the incident radiation occurring at wavelengths longer than the predetermined value.

3,671,287

INK TRANSFER MEMBER

Prakash N. Maniar, Rochester, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 20, 1970, Ser. No. 30,173
Int. Cl. B41m *5/10*
U.S. Cl. 117—36.4 **5 Claims**



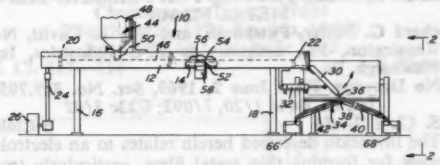
A reusable ink releasing member is disclosed having a polyester film substrate, a binder coat of a polyester material over the substrate, and a plastic ink releasing layer covering the binder. The plastic layer contains a combination of dye and pigment along with oil which functions as a solvent for the dye and a dispersant for the pigment as well as a vehicle for the ink which is released from the plastic layer when the reusable ink releasing member is subjected to pressure.

3,671,288

METHOD AND APPARATUS FOR APPLYING DECORATIVE COATING TO A SUBSTRATE

Karl Moses Rosenberg, Philadelphia, Pa., assignor to Flo-Tech Corp., Wilmington, Del.

Filed Jan. 9, 1970, Ser. No. 1,658
Int. Cl. B44f *9/00*; B05c *11/10*
U.S. Cl. 117—39 **9 Claims**



A method and apparatus are disclosed wherein a quantity of pigmented coating material is placed on the surface of a pool of supporting liquid, and a portion of the pool, with the coating material entrained, is drawn off and permitted to flow over a substrate. Excess liquid of the drawn off portion runs off, and the coating material remains on the substrate. The method can be performed on a continuous basis, the pool being a moving, continuously replenished body of liquid, and the strip to be coated being moved continuously past a position wherein the drawn off portion of the supporting liquid and the entrained coating material are applied thereto.

3,671,289

PRE-ETCH TREATMENT OF ACRYLONITRILE-BUTADIENE-STYRENE RESINS FOR ELECTROLESS PLATING

Eileen Maguire, San Gabriel, and Leon A. Kadison, Pasadena, Calif., assignors to Crown City Plating Co., El Monte, Calif.

No Drawing. Filed Sept. 23, 1969, Ser. No. 860,431
Int. Cl. B44d *1/092*; C23c *3/02*
U.S. Cl. 117—47 A 21 Claims

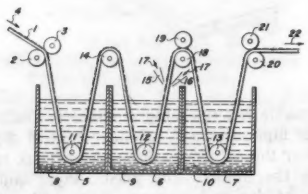
Solutions containing certain hydroxylated and etherified monoacetates are used to pre-etch ABS resins to improve the adhesion of metals in electroless plating processes.

3,671,290

IMAGING SYSTEM

Seiji Matsumoto, Yasuo Tamai, and Masamichi Sato, Asaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 21, 1970, Ser. No. 65,912
Claims priority, application Japan, June 25, 1969, 44/50,115
Int. Cl. G03g *13/10*
U.S. Cl. 117—37 LE 3 Claims



An electrostatic latent image bearing surface is developed with a liquid developer, rinsed with a first rinsing liquid having a boiling point between about 150° C. to about 350° C. at about atmospheric pressure, subjected to a stream of gas to remove most of the first rinsing liquid and thereafter rinsed with a second organic non-polar rinsing liquid which is soluble in and more volatile than the first rinsing liquid so as to remove developer-contaminated first rinsing liquid and any remaining background toner particles from said image bearing surface.

3,671,291

ELECTROLESS PROCESS FOR FORMING THIN METAL FILMS

Richard G. Miller, Pittsburgh, and Roy L. Cavitt, New Kensington, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed June 2, 1969, Ser. No. 829,705
Int. Cl. B44d *1/20, 1/092*; C23c *3/02*
U.S. Cl. 117—54 8 Claims

The invention described herein relates to an electroless process for forming thin metal films, particularly transparent films, on a reactive substrate. It particularly relates to a method of spraying two solutions, one, an acidic solution containing a metal salt and the other, an alkaline solution containing a boron reducing agent, onto a reactive substrate to form a metal film by reduction of the metal salt. More particularly, the invention relates to an electroless process for forming metal films of metals contained in Group I*b* and Group VIII of the Periodic Table, especially iron, cobalt, and nickel, by forming a solution of soluble salts of said metals in an acidic, aqueous media, preferably including boric acid and spraying said solution on a reactive substrate at substantially the same time that an alkaline solution of a boron-containing reducing agent, especially alkali metal borohydrides, is sprayed on the substrate. The invention has been found to be particularly useful for forming transparent films of cobalt, nickel, iron, and the like on sensitized transparent substrates such as glass and plastic.

3,671,292

ZIRCONIUM ANTI-SOIL TREATMENT OF SYNTHETIC FIBERS AND RESULTANT ARTICLE

Julian J. Hirshfeld and Bertie J. Reuben, Decatur, Ala., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 564,003, July 11, 1966, which is a continuation-in-part of applications Ser. No. 419,549, Dec. 18, 1964, and Ser. No. 419,601, Dec. 18, 1964. This application July 15, 1969, Ser. No. 841,977
Int. Cl. D06m *11/04, 13/00*
U.S. Cl. 117—62 17 Claims

Durable anti-soiling characteristics are imparted to textile articles comprised of synthetic fibers by treating them with an acidic aqueous solution containing a zirconium salt and a derivative of ammonia, then drying the textile article thereby to bond the evaporation residue of the solution, a zirconium reaction product, to the synthetic fibers. The process may be varied by first treating the fibers with the zirconium salt followed by treatment with the derivative of ammonia.

3,671,293

THERMOSETTING ACRYLIC ENAMEL CONTAINING MINOR AMOUNTS OF CELLULOSE ACETATE BUTYRATE

Leonard A. Walle, Flint, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation of abandoned application Ser. No. 780,191, Nov. 29, 1968. This application Jan. 8, 1971, Ser. No. 105,062
Int. Cl. B44d *1/38*; C08b *21/14*; C08g *37/32*
U.S. Cl. 117—74 10 Claims

A thermosetting enamel coating composition in which the film-forming material is a blend of the following polymers:

(1) an acrylic polymer of 0–6% by weight of an α,β-ethylenically unsaturated monocarboxylic acid, an acrylic ester of an alkyl methacrylate or an alkyl acrylate, or a combination thereof, 0–50% by weight of styrene and a hydroxyalkyl methacrylate or a hydroxyalkyl acrylate;
(2) a minor amount of cellulose acetate butyrate; and
(3) a thermosetting nitrogen containing resin.

3,671,294

MOISTURE RESISTANT PACKAGING MATERIAL

Richard Konrad Hopermann, Oakland, N.J., assignor to The Borden Company, New York, N.Y.

No Drawing. Filed Dec. 20, 1967, Ser. No. 691,942
Int. Cl. B44d *1/16*; B32b *27/10*
U.S. Cl. 117—76 7 Claims

This invention relates to a printing ink system which functions as a moisture vapor barrier system. More particularly, this invention relates to a moisture vapor barrier system for materials used for packaging whereby a primer coat comprising either a vinyl halide or a vinylidene chloride copolymer is applied to a packaging material and dried. Thereafter, a top lacquer composition which includes at least about 70% of a cyclized natural rubber, by weight based on the weight of the dry top lacquer components, is applied to the packaging material. The resultant moisture barrier system has a moisture transmission rate of 2 grams or less of water vapor per 100 square inches over a period of 24 hours at 100° F. and 90% relative humidity.

3,671,295

PROCESS FOR PREPARING CARBOXYL ACID CONTAINING OLEFIN POLYMER SURFACE COATINGS USING HIGH ENERGY IONIZING RADIATION

Abraham Ravve, Chicago, and Joseph T. Khamis, Brookfield, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 777,870, Nov. 21, 1968. This application Aug. 7, 1970, Ser. No. 62,172

Int. Cl. B44d *1/50, 1/44, 1/02*

U.S. Cl. 117—93.31 13 Claims

A process for coating articles wherein a film of an aqueous colloidal dispersion of a water dispersible carboxyl acid containing olefin polymer and a salt of a polyvalent metal is applied to the surface of the article to be coated, the aqueous dispersant is removed and the polymer cross-linked to form a hardened coating using high energy ionizing radiation.

3,671,296

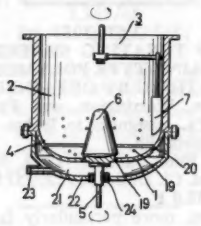
PROCESS FOR COATING GRANULAR MATERIALS

Yoshiro Funakoshi, Kyoto-shi, Takehiko Kajiura, Toyonaka-shi, Kiyoshi Fujii, Osaka-fu, Toshihiko Kanamaru, Kyoto-fu, Masaki Nishitani, Osaka-fu, and Hiromu Komeda, Gose-shi, Japan, assignors to Takeda Chemical Industries, Ltd.

Filed July 28, 1969, Ser. No. 845,296

Int. Cl. B05c *3/04, 3/08*

U.S. Cl. 117—100 B 3 Claims



This invention relates to a process for coating granular materials, including tablets and pills, and an apparatus for treating the surfaces of granules with coating materials, including liquid and powder, and/or dry air. The apparatus of the invention comprises a dish mounted rotatably at its center and a stationary barrel having a smoothly curved inner-surface which continues upwards from the periphery of the dish. The granules to be coated are continuously circulated in a receptacle integral with the dish and the barrel by rotating the dish. Such circulation of the granules provides excellent fluidity and abrasion between granules that coating materials and/or dry air spread uniformly over and contact all granule surfaces in a short time.

3,671,297

METHOD OF CHROMIZING IN A FUSED SALT BATH

Noboru Komatsu, Tohur Arai, and Masayoshi Mizutani, Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho

Filed Mar. 2, 1971, Ser. No. 120,155

Claims priority, application Japan, Mar. 16, 1970, 45/19,437

Int. Cl. C23c *9/10*

U.S. Cl. 117—113 18 Claims

A method of treating metals and alloys in which a fused salt bath consisting of at least one boron-containing salt such as boron oxide (B_2O_3) or borax ($Na_2B_4O_7$), and a chromium-containing material is prepared and a material to be treated is immersed in the fused salt bath as a result of which a chromium-impregnated layer with fine structure and with excellent resistance to corrosion, oxidation and wear is formed at the surface of the metal.

3,671,298

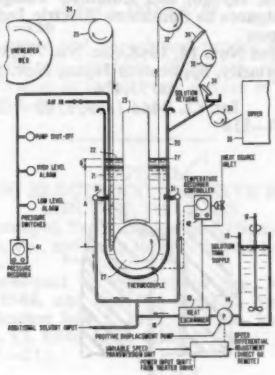
HYDRAULIC SYSTEM FOR CONTROLLING RESIN PICKUP

Maurice J. Maynard, Ridgefield, Conn., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,318

Int. Cl. B44d *1/06*

U.S. Cl. 117—115 3 Claims



This invention discloses a hydraulic system for resin pickup that will yield precise control of liquid addition without the need for sampling, testing and operator control. The system is based on precise introduction of a volume of liquid into the system at a volume rate of flow predetermined to yield a desired solids content at the sheet through-put rate involved. The system is self-controlling, as a temporary decrease in liquid absorption causes an increase in liquid level thereby increasing sheet-liquid contact time and pressure. Conversely, an increase in adsorption causes the level to fall, reducing contact time and pressure and thereby the volume of liquid absorbed. An equilibrium liquid level is reached at the point where the absorption is equal to the rate of liquid in-put to the system.

3,671,299

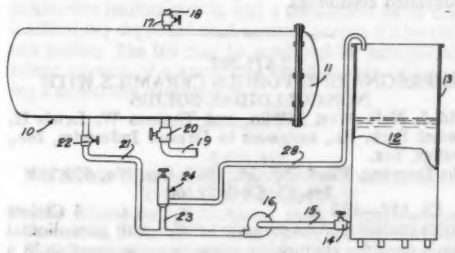
METHOD FOR IMPREGNATING WOOD

Jackson Herman Barnett, Jr., 84 N. Crest Road, Chattanooga, Tenn. 37404

Filed Feb. 26, 1970, Ser. No. 14,349

Int. Cl. B44d *1/26;* B05c *3/02*

U.S. Cl. 117—116 5 Claims



Method for impregnating wood with liquid treating solutions such as preservatives, fire retardants, or the like wherein the wood is immersed in a confined pressure vessel, and treating liquid is pumped into the vessel in direct

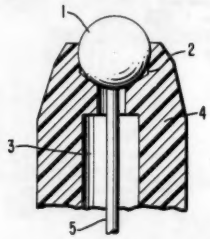
pressure contact with the wood at a rate of flow sufficient within no more than ten minutes to build up a pressure therein in excess of a predetermined pressure within the range from 20 to 700 p.s.i. gauge. The pumping is effected without causing pulsations in excess of 5.0 p.s.i. gauge peak to peak within the pressure vessel. Excess treating liquid is bypassed and recirculated at a predetermined pressure.

3,671,300

NYLON MOLDING ARTICLES AND PROCESS FOR PRODUCING THE SAME

Takao Kawakita and Hirosaka Ikeda, Osaka, Shigeru Matsumura, Hyogo, and Kunihiko Taniguchi, Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed Nov. 14, 1968, Ser. No. 775,595
Claims priority, application Japan, Nov. 14, 1967, 42/73,476
Int. Cl. B44d *1/09, 1/02*
U.S. Cl. 117—118 6 Claims



Nylon molding article having an addition or cross-linking reaction product layer on at least the surface thereof produced by treating the molded nylon article with an epoxy compound, an isocyanate compound, a ketene or a carbodiimide. Inorganic bulking agents may be included.

Process for forming the nylon molding article comprises treating the article by heating the article in a fluid comprising one of the above-recited compounds.

3,671,301

HIGH TEMPERATURE PRESSURE-SENSITIVE ADHESIVES MADE BY REINFORCEMENT WITH POLYURETHANE POLYMERS

Rolf Dahl, West Columbia, S.C., assignor to Continental Tapes, Incorporated, Columbia, S.C.

No Drawing. Continuation-in-part of application Ser. No. 762,995, Sept. 26, 1968. This application May 6, 1969, Ser. No. 822,314
Int. Cl. C09j *7/02*
U.S. Cl. 117—122 P 11 Claims

Ordinary pressure-sensitive adhesives based on natural or synthetic rubber are made high temperature resistant by curing with reaction-products of polyisocyanates and hydroxylated elastomers.

3,671,302

IMPREGNATING POROUS CERAMICS WITH NONCOLLOIDAL SOLIDS

David J. Nell, West Mifflin, and Thomas W. Lewis II, Bethel Park, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

No Drawing. Filed Oct. 30, 1967, Ser. No. 679,191
Int. Cl. C04b *21/00*
U.S. Cl. 117—123 A 4 Claims

Impregnating porous ceramic articles with noncolloidal ceramic particles comprising, preparing a suspension in a carrier fluid of noncolloidal ceramic particles, immersing the ceramic articles in the slurry, maintaining said particles dispersed, and agitating the slurry for sufficient period of time to impregnate at least a portion of the ceramic articles.

3,671,303

STRONG FIRE RETARDANT WEBS

Gary H. Meitner, Oshkosh, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

No Drawing. Filed June 26, 1970, Ser. No. 50,310
Int. Cl. D04h *1/64*
U.S. Cl. 117—137 4 Claims

Nonwoven webs such as cellulosic webs are treated with a binder polymer having a low glass transition temperature and containing halogen substitutes and a fire retarding agent. The resulting products are strong, drapable, and fire retardant.

3,671,304

PROCESS FOR FLAMEPROOFING AND RESULTANT PRODUCT

Vladimir Mischutin, Hackensack, N.J., assignor to Arkansas Company, Inc., Newark, N.J.

No Drawing. Filed Apr. 23, 1970, Ser. No. 31,398
Int. Cl. C09d *5/18;* C09k *3/28*
U.S. Cl. 117—136 16 Claims

There is provided a novel type of fireproofing composition for cellulosic and synthetic materials suitable for textile use and methods of preparing and utilizing said compositions. The novel compositions are prepared by mixing either a polyalkylenimine or the reaction product of a polyalkylenimine with an amide, with a halo alkyl phosphate ester under aqueous conditions. The materials are proofed by immersion into an aqueous solution, suspension or emulsion of the proofing composition and dried at an elevated temperature.

3,671,305

METHOD OF TREATING SHAPED ARTICLES WITH BETAINE-TYPE POLYMERS AND THE ARTICLES THEREBY OBTAINED

Albert B. Brown, Warrington, and Frank J. Parkhill, Elkins Park, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Jan. 30, 1970, Ser. No. 7,268
Int. Cl. D06m *15/52, 15/54*
U.S. Cl. 117—138.8 F 10 Claims

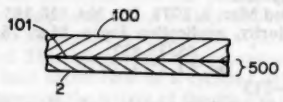
Shaped articles, more particularly fabrics of various fibers, especially cotton and/or hydrophobic synthetic fibers, e.g., of linear polyesters (such as of polyethyleneglycol terephthalate) are treated with polymers of betaines or sulfobetaines or copolymers thereof with or without acrylic acid and/or an acrylic ester, such as methyl acrylate—preferably the treating composition also contains an aminoplast condensate capable of imparting creaseproofing, wrinkleproofing, and durable press characteristics on curing with an acidic catalyst. The process and treated fabrics are claimed.

3,671,306

BORON CARBIDE FILM PRODUCT

Lloyd R. Allen, Belmont, Mass., assignor to National Research Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 611,191, Nov. 25, 1966, which is a continuation-in-part of application Ser. No. 524,615, Feb. 1, 1966. This application Nov. 28, 1969, Ser. No. 880,660
Int. Cl. C23c *11/02;* B44d *1/22*
U.S. Cl. 117—138.8 N 7 Claims



Boron carbide films produced by vacuum deposition. The films are black and shiny, amorphous and have bend tensile strength on the order of 300,000 p.s.i. and elastic modulus of 40 million p.s.i.

3,671,307
CREASE-PROOFING COMPOSITIONS CONTAINING GLYOXAL MODIFIED URON RESINS AND PROCESSES FOR MAKING SAME

Myrtle Joanne Spangler, Danville, Va., assignor to Dan River Inc., Danville, Va.

No Drawing. Filed Dec. 4, 1969, Ser. No. 882,346
Int. Cl. C08g 9/10, 9/32; D06m 15/58
U.S. Cl. 117—139.4 9 Claims

Crease-proofing compositions containing methylol urons and/or alkyl ethers of same and methylol-4,5-dihydroxy-2-imidazolidinone and/or alkyl ethers of same substantially free of methylol ureas and alkyl ethers thereof. These compositions are made by contacting uron preparations, made by reacting urea and formaldehyde, with or without an alkanol, with glyoxal to convert methylol ureas and alkyl ethers thereof ordinarily contained in such uron preparations into methylol-4,5-dihydroxy-2-imidazolidinone and/or alkyl ethers thereof. Cellulosic textiles treated with the resulting compositions are characterized by unexpectedly low retained chlorine damage.

3,671,308
TEXTILE SOFTENING AGENTS

Helmut Diery, Kelkheim, Taunus, Germany, Bernhard Kiefer, Sao Paulo, Brazil, and Siegbert Rittner and Manfred Seidel, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

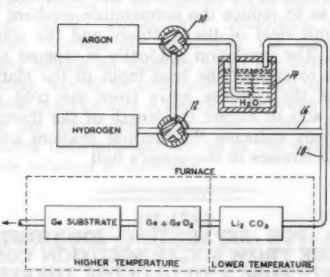
No Drawing. Filed July 28, 1969, Ser. No. 845,505
Claims priority, application Australia, July 29, 1968, 7,347/68
Int. Cl. D06m 15/54
U.S. Cl. 117—139.5 A 4 Claims

Process for the softening of textile materials consisting of or containing cellulose fibers, wherein these materials are treated with solutions or dispersions of reaction products of at least 3 mols of formaldehyde and 1 mol of a N-alkyl-urea or a N-alkyl-biuret containing 14 to 22 carbon atoms in the alkyl radical.

3,671,309
PROCESS FOR MAKING TETRAGONAL GERMANIUM DIOXIDE

Walter A. Albers, Jr., Northville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1970, Ser. No. 28,773
Int Cl. C23f 7/02
U.S. Cl. 117—201 8 Claims



A process and apparatus for directly oxidizing germanium into its insoluble oxide, the tetragonal form of germanium dioxide. A germanium surface portion is cleaned of all oxides and a new oxide is grown directly on that cleaned surface at normal pressure in a mildly oxidizing atmosphere containing a germanium monoxide vapor and an octahedral coordination catalyst. The apparatus provides particular means for growing a film of the tetragonal dioxide directly on the surface of a germanium wafer in a single furnace treatment.

3,671,310
PAPER SURFACE SIZING PROCESS AND PRODUCT UTILIZING CATIONIC AMYLOSE DERIVATIVES

Gerald H. Brown, Lebanon, and Emil D. Mazzarella, Mountainside, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

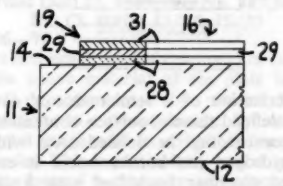
No Drawing. Filed May 7, 1968, Ser. No. 727,361
Int. Cl. D21h 1/34
U.S. Cl. 117—156 10 Claims

Sizing of paper and paperboard products which comprises applying an aqueous dispersion of a cationic amylose derivative to at least one surface of a previously prepared cellulosic web.

3,671,311
APPLYING ELECTROCONDUCTIVE HEATING CIRCUITS TO GLASS

Milton S. Tarnopol, Brackenridge, and Thomas P. Snyder, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of applications Ser. No. 737,907, June 18, 1968, and Ser. No. 826,433, May 21, 1969. This application July 1, 1969, Ser. No. 838,163
Int. Cl. B44d 1/18; C03c 17/08, 17/10
U.S. Cl. 117—211 9 Claims



Applying a decorative coating or design of electroconductive material to a glass base. When the base is transparent, the resulting article is useful as a readily heated window from which fog and ice can be readily removed on heating. A frit composition having an appropriate coefficient of expansion, an appropriate maturing temperature, and which matures into a rough, porous coating, is applied to a glass sheet surface in the circuit pattern desired, the sheet is heated and then cooled rapidly to produce a tempered glass sheet having a rough, porous frit coating conforming to the pattern desired for the electroconductive heating circuit, and a conductive metal coating is selectively deposited on the rough, porous frit by electroless plating. The frit may be sensitized by incorporating a minor amount of a sensitizing metal therein or by applying a sensitizing composition.

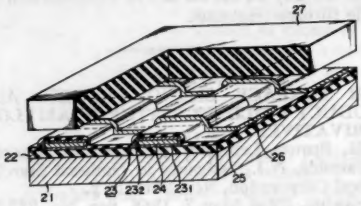
3,671,312
METHOD FOR MANUFACTURING MAGNETIC THIN FILM ELEMENT

Yoshio Murakami, Yokohama, Iwao Higashinakagawa, Kawasaki, Nobuaki Yasuda, Zushi, and Syozo Takeno, Yokohama, Japan, assignors to Tokyo-Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed July 29, 1970, Ser. No. 59,291
Int. Cl. H01f 10/06
U.S. Cl. 117—212 4 Claims

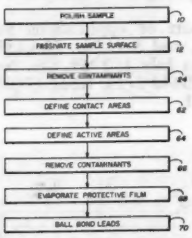
A method for vapor depositing a magnetic thin film element mainly comprising nickel Ni and iron Fe on the sur-

face of a substrate within a magnetic field in an atmosphere of inert gas at a pressure of 1×10^{-3} to 5×10^{-2}



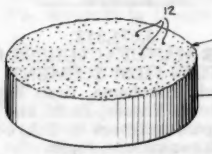
mm. Hg, to form a uniform magnetic thin film with reduced variations in the direction of the easy axis.

3,671,313
SURFACE CONTAMINANT REMOVAL
Richard A. Reynolds, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 13, 1969, Ser. No. 876,346
Int. Cl. H01l 7/00
U.S. Cl. 117—212 **10 Claims**



In the fabrication of a semiconductor device having active areas defined therein, surface contaminants are removed by bombarding the defined areas with hydrogen ions. The hydrogen ion bombardment is completed in an evacuated chamber backfilled with hydrogen to a pressure on the order of 100 microns of Hg. A glow discharge is established in the backfilled evacuated chamber to produce atomic hydrogen that reacts with the contaminants which then desorb the semiconductor surface. A protective film is evaporated over the cleaned surface to prevent further contamination thereof.

3,671,314
TUNGSTEN ELECTRICAL SWITCHING CONTACTS
Henry Clinton Gackstetter, North Branford, Harold Francis Anderson, Guilford, and Gordon William Shove, Mount Carmel, Conn., and Louis George Morin, Tarrytown, N.Y., assignors to The Echlin Manufacturing Corporation, Branford, Conn.
Filed Jan. 29, 1970, Ser. No. 6,784
Int. Cl. B44d 1/34; B22f 7/00
U.S. Cl. 117—213 **13 Claims**



A tungsten contact disc is treated by burnishing so as to smooth and compact the contact surface and remove the surface-crazed metals and oxides, while simultaneously filling the surface pores with a contaminant such as iron. The contaminants present in the pores are subsequently removed by immersing the contact disc in a dissolving agent, and the remaining natural oxides of the tungsten are removed from the walls of the pores by cathodic reduction, so as to create large pore sites which are free of oxides and contaminants. Next, there is applied a coating of a diffusion-absorbing metal, such as nickel, to the contact disc to provide a diffusion-absorbing layer for an outer film of gold. The gold lining the pore sites is applied with a thickness sufficient to maintain an amount of non-alloyed gold on the contact surface after some of the gold has been diffusion absorbed by the underlying nickel layer. During electrical switching operations, the gold alloys with the nickel, and the gold and gold alloy lining the pore surfaces are effective to prevent oxide formation on the pore surfaces and to substantially reduce surface destruction by the arc heat, thereby affording a longer contact operating life.

3,671,315
THERMAL TRANSITION DESIGN FOR VESSELS CARRYING LIQUID CARGOES AT NONAMBIENT TEMPERATURES
Frank J. Iarossi, Middletown, N.J., assignor to Esso Research and Engineering Company
Filed Apr. 28, 1970, Ser. No. 32,691
Int. Cl. B63b 25/16
U.S. Cl. 114—74 A **2 Claims**

An externally insulated integral tanker vessel intended especially for the transport of liquid cargoes at temperatures differing from ambient temperature, including bow and stern sections, joined to the cargo midbody, which is at the temperature of the cargo, in such a manner as to maintain substantially ambient temperatures throughout the end portions of the tanker hull. Toward this end there is provided a temperature transition area or compartment at each end of the cargo midbody section to minimize the thermal stresses that normally would occur between the cold hull of the midbody and the relatively warm hull at either end of the tanker. The entire hull is constructed as a continuous shell similar to that of a conventional vessel. The shell plating in the transition area is insulated internally and externally in such a manner as to reduce the temperature gradient between the cold hull steel of the midbody and the warm steel at the end. The insulation gradually is tapered along the shell so as to control the heat input to the plating as a function of the distance away from the cold midbody steel. This acts to extend the length of the thermal transition, thereby reducing the thermal gradient and resulting thermal stresses in the vessel's hull.

3,671,316
METHOD FOR SEPARATING FRUCTOSE AND GLUCOSE FROM SUGAR SOLUTION CONTAINING FRUCTOSE AND GLUCOSE THEREIN
Ryoki Tatuki, 16 Azo Teramachi, Goshogawara, Japan
No Drawing. Filed Feb. 1, 1971, Ser. No. 111,622
Claims priority, application Japan, Feb. 6, 1970, 45/10,012
Int. Cl. C13k 3/00
U.S. Cl. 127—46 R **5 Claims**

Method for the separation of glucose from fructose in a solution thereof which involves complexing the glucose

with sodium chloride. The complex containing the glucose is crystallized out of solution and separated as by filtration.

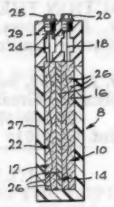
3,671,317
METHOD OF MAKING FUEL CELL ELECTRODES
Ernest Rifkin, De Witt, N.Y., assignor to United Aircraft Corporation, East Hartford, Conn.
No Drawing. Filed Feb. 10, 1970, Ser. No. 10,165
Int. Cl. H01m *27/00*; B01k *3/04*
U.S. Cl. 117—216 3 Claims

In expensive screen substrates for fuel cell electrodes are provided with a nonporous vinylidene fluoride corrosion resistant coating. Thereafter, a second, metal particle and porous polymer, coating is provided. Cure of the second coating must be compatible with the first coating and monitored to prevent the flow of the polymer in the second coating so that a porous structure with the desired hydrophilic properties and conductive properties preferred in electrode structure can be obtained.

ERRATUM

For Class 127—46 see:
Patent No. 3,671,316

3,671,318
METHOD FOR PRODUCING A WATER ACTIVATABLE BATTERY
George Moe, Santa Ana, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed June 12, 1969, Ser. No. 832,618
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 8 Claims



A water activatable battery comprising as components a pair of electrodes, e.g. Ag-Zn, in the fully charged state and a separator, e.g. composed of olivine, between them, the components being substantially dry and having the evaporation residue of an aqueous alkali electrolyte solution, e.g. KOH, substantially uniformly distributed throughout. Method for producing the above battery comprising adding an aqueous alkali electrolyte solution to a battery having as components a pair of electrodes of opposite polarity and a separator between them, fully charging the electrodes, drying the battery at elevated temperatures until substantially all of the water from the electrolyte solution is removed.

3,671,319
BATTERY ELECTRODE AND BATTERY EMBODYING SAME
Frank C. Arrance, Costa Mesa, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Aug. 4, 1969, Ser. No. 847,332
Int. Cl. H01m *35/00, 43/02*
U.S. Cl. 136—6 15 Claims

Production of zinc electrode of improved strength and reduced solubility in alkali solution and having improved capacity retention during deep discharge cycling when employed in a high energy density battery, such as a silver-zinc battery, by sintering a mixture of zinc oxide and certain additive oxides such as zirconium oxide, and forming a solid solution of a portion of the zinc oxide and said additive oxide, said sintered solid solution forming a substantially inert matrix and the remainder of said zinc oxide being free active zinc oxide.

3,671,320
BATTERY PLATE TREATMENT PROCESS
Bernard B. Herman and Vincent P. Farley, Jr., Edison, N.J., assignors to Gulton Industries, Inc., Metuchen, N.J.
Filed Dec. 23, 1969, Ser. No. 887,549
Int. Cl. H01m *35/18, 35/30*
U.S. Cl. 136—75 11 Claims

A process and apparatus for treating battery plates formed by impregnating a porous substrate with a metallic nitrate and subjecting the impregnated substrate to an alkaline earth hydroxide for formation of active material in the form of a metallic hydroxide, with formation of soluble nitrates as a by-product, in which the soluble nitrates are prevented from creating contamination of the plates, by cathodizing them into ammonia and carbon dioxide gas in a tank having a pair of electrodes and one or more insulated electrically floating metallic baffle plates between the electrodes.

3,671,321
PROCESS FOR PRODUCTION AND TREATMENT OF BATTERY PLATES
Bernard B. Herman and Vincent P. Farley, Edison, N.J., assignors to Gulton Industries, Inc., Metuchen, N.J.
Filed Dec. 23, 1969, Ser. No. 887,552
Int. Cl. H01m *35/18, 35/30*
U.S. Cl. 136—75 23 Claims

A process and apparatus for treatment of battery plates, in which the active material of the plate is electrically formed and decontaminated by electrolyzing without direct connections to a power source, by interposing the active material insulatedly in a bath between two energized electrodes. This is particularly useful in the case of battery plates formed by impregnating a porous substrate with a metallic nitrate and subjecting the impregnated substrate to an alkaline earth hydroxide for formation of active material in the form of a metallic hydroxide.

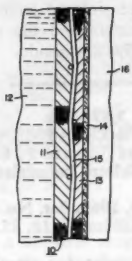
3,671,322
ELECTROCHEMICAL CELL WITH ALUMINUM ELECTRODES AND DIFFERENT ELECTROLYTE CONCENTRATION IN TWO COMPARTMENTS
Lowell A. King and David W. Seegmiller, both of Air Force Academy, Colo. 80840
Filed Aug. 12, 1970, Ser. No. 63,224
Int. Cl. H01m *11/00*
U.S. Cl. 136—83 R 3 Claims

An electrochemical cell of the thermal type. The cell comprises two interconnected compartments with separate aluminum electrodes positioned in each compartment. The electrodes in turn are immersed in a solid electrolytic material comprising a mixture of aluminum chloride and sodium chloride.

3,671,323
HYDROPHOBIC LAYERS FOR GAS DIFFUSION ELECTRODES
Yehuda L. Sandler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 12, 1970, Ser. No. 2,042
Int. Cl. H01m *27/04, 13/02*
U.S. Cl. 136—86 D 10 Claims

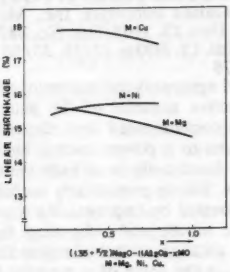
A gas diffusion electrode having a gas entrance side and an electrolyte contacting side for use with a liquid

electrolyte and a gas in an electrochemical cell, comprises a coherent porous body, containing an electrical conductor



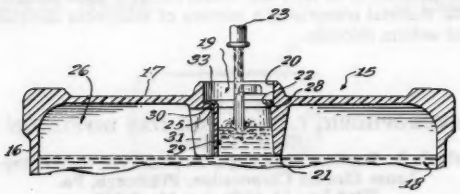
and a hydrophobic outer layer on the gas entrance side, the hydrophobic outer layer comprising cloth material impregnated with wet proofing polymer.

3,671,324
SOLID ELECTROLYTE
Atsuo Imai, Mituo Harata, Yoshitaka Ogawa, and Shoji Hasegawa, Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed June 2, 1970, Ser. No. 42,792
Claims priority, application Japan, June 5, 1969, 44/43,635
Int. Cl. H01m *43/06*
U.S. Cl. 136—153 **2 Claims**



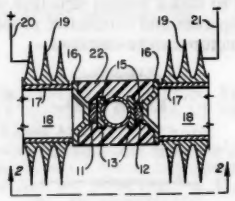
In the β-alumina solid electrolyte using the phenomenon of conduction of Na^+ ion, a solid electrolyte formed by adding and baking 0.9 to 20 mol percent of CuO calculated in terms of the amount of a mixture of Na_2O, Al_2O_3 and CuO.

3,671,325
SEALING ASSEMBLY FOR STORAGE BATTERIES
Verlin A. Mocas, Indianapolis, Ind., assignor to The Richardson Company, Melrose Park, Ill.
Filed Apr. 27, 1970, Ser. No. 32,044
Int. Cl. H01m *7/00*
U.S. Cl. 136—178 **3 Claims**



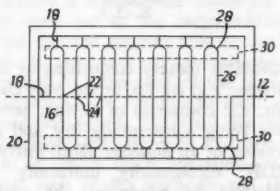
A sealing assembly for the cell compartment of an electric storage battery which precludes electrolyte overfilling and comprising a rotatable sealing means mounted on a filling well and cooperable with the cell compartment capping means so as to close the void space within the cell compartment to the atmosphere during filling and open the void space when the capping means close the filling well.

3,671,326
THERMOELECTRIC ASSEMBLIES
Thore M. Elfving, 433 Fairfax Ave., San Mateo, Calif. 94402
Continuation of application Ser. No. 781,672, Oct. 10, 1968, which is a continuation of application Ser. No. 460,209, June 1, 1965. This application Dec. 4, 1969, Ser. No. 876,161
Int. Cl. H01v *1/30, 1/32*
U.S. Cl. 136—205 **7 Claims**



A thermoelectric assembly having bimetallic junction bridge elements comprised of copper in contact with end plates permanently secured to the semiconductor material to conduct the electric current passing through the semiconductor material and aluminum fins for heat exchange to air.

3,671,327
MULTIJUNCTION THERMOCOUPLES
Frank Munro Gay, Felixstowe, Suffolk, England, assignor to A. C. Cossor Limited, Harlow, Essex, England
Filed Mar. 12, 1969, Ser. No. 806,435
Claims priority, application Great Britain, Mar. 13, 1968, 12,260/68
Int. Cl. H01v *1/02*
U.S. Cl. 136—225 **3 Claims**

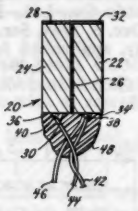


A multijunction thermocouple is made by etching a metal foil having differing metals to either side of a boundary line, so as to leave a pattern which zig-zags across the boundary line and forms a row of junctions along the boundary line.

3,671,328
SEMICONDUCTOR TEMPERATURE SENSITIVE MEANS
William Paul Dixon, Florissant, Mo., and David N. Kendall, Alton, Ill., assignors to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Aug. 28, 1967, Ser. No. 663,757
Int. Cl. H01v *1/04*
U.S. Cl. 136—230 **11 Claims**

A temperature measuring thermocouple device constructed of at least two semiconductor materials having differing thermoelectric properties, said materials having adjacent surfaces arranged and constructed to form a

thermoelectric junction therebetween for exposing to a temperature condition to be sensed and measured, said device also having electrical connection means attached



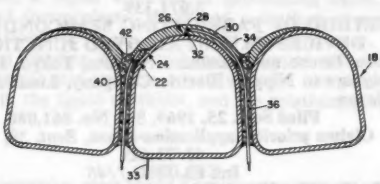
to each of the semiconductor materials at plates thereon remote from the junction for connection to suitable meter means.

3,671,329

APPARATUS FOR SENSING TEMPERATURE

Ronald G. Huff, North Olmsted, Ohio, assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 18, 1969, Ser. No. 877,717
Int. Cl. G01k *7/02, 13/02;* H01v *1/04*
U.S. Cl. 136—233 **12 Claims**



Measuring the surface temperature of a wall heated by a flowing fluid without disturbing the foundry layer. A thin electrical conductor forming a thermocouple junction is covered by a layer of protective material to guide the flow of fluid over the junction.

3,671,330

REMOVAL OF ACCEPTOR IMPURITIES FROM HIGH PURITY GERMANIUM

Robert N. Hall, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Filed Oct. 21, 1970, Ser. No. 82,788
Int. Cl. C22b *41/00*
U.S. Cl. 148—1.6 **8 Claims**

Ultra-pure germanium is prepared free of acceptor impurities by melting zone refined, or comparable purity, germanium in a quartz crucible and growing single crystals from the melt by seed crystal withdrawal ingot growth. The process is repeated until the desired purity is obtained. Prior to re-use of previously used crucibles, crucibles are etched to remove acceptor-quartz reaction product from the surface thereof.

3,671,331

COATED METAL AND METHOD

Irving Malkin, University Heights, Bert E. Palm, Mentor, Jon A. de Ridder, Ashtabula, and Victor V. Germano, Mentor-on-the-Lake, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Continuation-in-part of application Ser. No. 729,918, May 17, 1968. This application Mar. 16, 1970, Ser. No. 20,085
Int. Cl. C23f *7/26*
U.S. Cl. 148—6.2 **25 Claims**

A weldable, adherent coating provides enhanced corrosion protection for metal substrates as well as augmenting paint adhesion to such substrates. The coating is substantially resin-free and comprises a pulverulent metal in intimate mixture with the residue from a hexavalent-chromium-containing coating composition for metal substrates. The residue is water insoluble and is obtained by heating the substrate containing applied coating composition and also containing the pulverulent metal.

3,671,332

METAL TREATING PROCESS

Werner Rausch, Stierstadt, Taunus, and Hans Young Oei and Siegfried Moller, Frankfurt am Main, Germany, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed July 15, 1969, Ser. No. 841,993
Int. Cl. C23f *7/10*
U.S. Cl. 148—6.17 **3 Claims**

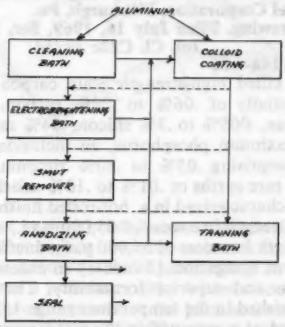
An immersion phosphating process for iron and steel wherein the steel is contacted at room temperature to 50° C. with a zinc phosphate solution containing nitrite and at least one soluble reducing sulfur-oxygen compound in which the sulfur has a positive valence of from 2 to 5. Suitable compounds include Na_2SO_3, $Na_2S_2O_3$, $Na_2S_3O_4$ and $Na_2S_2O_5$.

3,671,333

COATED REFLECTIVE SURFACE AND METHOD OF MAKING SAME

Benjamin Mosier, Houston, Tex., assignor to Esquire, Inc.

Filed June 9, 1969, Ser. No. 831,617
Int. Cl. C23f *7/06*
U.S. Cl. 148—6.27 **25 Claims**



Reflective aluminum surface for high powered fixtures are improved by applying a natural or synthetic hydrophilic colloid to the surface. Usually the colloid is applied during anodizing of the aluminum surface. In one form the colloid is tanned or cross-linked to provide a more durable coating. In an especially preferred embodiment, the colloid and tanning agent are both present in the anodizing bath so that the colloid forms a collidate and is tanned during anodizing. In any event, the colloid is chemically absorbed (chemisorbed) and/or electrolitically deposited on the surface. The coatings are much thinner, e.g. $\frac{1}{10}$ to $\frac{1}{5}$ the thickness of normal anodized coatings.

3,671,334

HIGH-STRENGTH STEEL HAVING AGING PROPERTIES

John H. Bucher, Bethel Park, and John F. Held, Verona, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Aug. 7, 1970, Ser. No. 62,073
Int. Cl. C21d *7/14;* C22c *39/54*
U.S. Cl. 148—12.3 **14 Claims**

Steels having the following composition: .08 to .18% carbon; .3 to 1.0% manganese; .01 to .05% columbium; .008 to .014% nitrogen; .10% maximum silicon; less than

a total of approximately .02% of the nitride-forming elements aluminum, zirconium, vanadium and titanium; and the balance essentially iron, after appropriate processing, have yield strengths of 50,000 to 70,000 p.s.i. in hot-rolled and cold-rolled conditions and yield strengths of 70,000 to 90,000 p.s.i. after straining and aging.

3,671,335

NON-REACTIVE REFRACTORY SEPARATING COATINGS FOR ELECTRICAL STEELS

Norman M. Pavlik, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Original application Nov. 6, 1967, Ser. No. 681,026, now Patent No. 3,523,837. Divided and this application Mar. 25, 1970, Ser. No. 22,682

Int. Cl. H01f *1/18*

U.S. Cl. 148—28 **3 Claims**

An aqueous slurry comprising about 60% by weight of Al_2O_3, based on the weight of the water, and small amounts of polyvinyl alcohol and an organic suspending agent (more particularly, a cellulosic suspending agent), is applied to electrical sheet steel and dried thereon to provide a relatively thin and uniform separating coating. A plurality of such coated sheets may be stacked or a single such sheet may be coiled for final annealing at elevated temperature.

3,671,336

HIGH-STRENGTH PLAIN CARBON STEELS HAVING IMPROVED FORMABILITY

Michael Korchynsky, John David Grozier, and John L. Mihelich, Bethel Park, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

No Drawing. Filed July 16, 1969, Ser. No. 842,338

Int. Cl. C22c *39/54*

U.S. Cl. 148—36 **6 Claims**

Fully killed high-strength plain carbon steels consisting essentially of .06% to .20% carbon, .4% to 1.2% manganese, .005% to .3% silicon, .04% maximum sulfur, .04% maximum phosphorus, an inclusion shape control agent comprising .05% to .20% zirconium, or .01% to .10% of rare earths or .01% to .10% mischmetal, balance iron are characterized in a hot-rolled finished condition by a yield strength in excess of 35,000 p.s.i., an ultimate tensile strength in excess of 55,000 p.s.i., ductility as measured by percent elongation (2 inches) in excess of 30%, good toughness and superior formability. The steels are hot-rolled finished in the temperature range 1550° F. to 1650° F., cooled at a rate within the temperature range 20° F. to 135° F. per second and collected by coiling or piling within a temperature range of 900° F. to 1200° F., preferably between 1025° F. to 1175° F.

3,671,337

PROCESS FOR PRODUCING GRAIN ORIENTED ELECTROMAGNETIC STEEL SHEETS HAVING EXCELLENT MAGNETIC CHARACTERISTICS

Ko Kumai, Minoru Motoyoshi, Kiyoshi Tanaka, and Yasuhira Hakiwara, Himeji, Japan, assignors to Nippon Steel Corporation, Chiyoda-ku, Tokyo, Japan

Filed Feb. 5, 1970, Ser. No. 8,926

Claims priority, application Japan, Feb. 21, 1969, 44/13,074

Int. Cl. H01f *1/16*

U.S. Cl. 148—111 **8 Claims**

A process for producing grain oriented electromagnetic steel sheets having excellent magnetic characteristics. The steel contains MnS within a critical range and the Si content of said steel is controlled by the inclusion therein of Al as a deoxidant. The process comprises slab-heating a slab of the above-described steel at about 1150° C. to about 1280° C. and then hot rolling the steel followed by a two-step cold-rolling operation with an intermediate annealing step.

3,671,338

METHOD OF MANUFACTURING A SEMICONDUCTOR PHOTO-SENSITIVE DEVICE

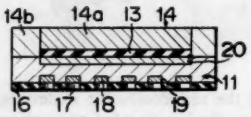
Akihiro Fujii, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 5, 1969, Ser. No. 882,679

Claims priority, application Japan, Dec. 9, 1968, 43/89,594

Int. Cl. H01l *7/36, 5/00;* C23c *13/00*

U.S. Cl. 148—175 **12 Claims**



A method of manufacturing a semiconductor photosensitive device includes the steps of forming a poly crystal formation layer on the flat surface of an N-type semiconductor substrate excluding the peripheral edge thereof, depositing a crystal layer on the surface including a poly crystal region overlaying the poly crystal formation layer, forming a plurality of PN junctions in the opposite surface of the substrate, and removing the poly crystal region, thereby forming a recess structure substrate.

3,671,339

METHOD OF FABRICATING SEMICONDUCTOR DEVICES HAVING ALLOYED JUNCTIONS

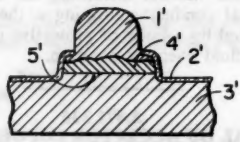
Hideo Tateno and Kuniharu Nemoto, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 25, 1969, Ser. No. 861,080

Claims priority, application Japan, Sept. 30, 1968, 43/71,619

Int. Cl. H01l *7/46*

U.S. Cl. 148—179 **2 Claims**



A method of fabricating alloyed junction semiconductor devices is disclosed in which the junction is prepared in the form of a mesa having a predetermined position and configuration. The alloy junction is formed within that protrusion, thereby to control the spread of the alloying material.

3,671,340

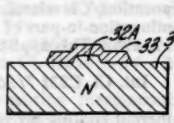
TRANSISTOR DEVICE WITH PLATEAU EMITTER AND METHOD FOR MAKING THE SAME

Toshiaki Irie, Katsuo Sato, and Yoshiyuki Nanko, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Application May 14, 1969, Ser. No. 827,101, now Patent No. 3,530,343, dated Sept. 22, 1970, which is a continuation of application Ser. No. 571,204, Aug. 9, 1966. Divided and this application Feb. 6, 1970, Ser. No. 9,340

Int. Cl. H01l *7/44*

U.S. Cl. 148—187 **2 Claims**



A semiconductor device and a method for making the same, in which diffusion of impurities forming the col-

lector and emitter areas of the device are confined to raised portions of the substrate. Undesired lateral diffusion of the impurities is thus eliminated.

3,671,341
DENSE PROPELLANT COMPOSITION
Arthur Jack Dierolf, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy
No Drawing. Filed June 24, 1965, Ser. No. 467,826
Int. Cl. C06d *5/06*
U.S. Cl. 149—19 **3 Claims**

A propellant which has a flame temperature of 4700° F. or lower. It consists of a mixture of Teflon, Viton, a dense metal oxidizer such as mercuric oxide, and a heavy metal such as uranium.

3,671,342
DYNAMITE COMPOSITION CONTAINING EXPANDED THERMOPLASTIC BEADS
Frank E. Slawinski, Tamaqua, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.
No Drawing. Filed Jan. 2, 1970, Ser. No. 424
Int. Cl. C06b *1/00, 1/04, 19/04*
U.S. Cl. 149—21 **12 Claims**

A dynamite composition comprising an inorganic oxidizer salt, a liquid sensitizer, a gelatinizing agent, and expanded thermoplastic beads and a method of making it. Thermoplastic beads, preferably of polystyrene, containing a blowing agent such as entrapped gas are expanded with heat and are mixed with the inorganic oxidizer salt, the liquid sensitizer, and the gelatinizing agent.

3,671,343
COMPOSITION FOR EXPLOSIVES COMPRISING AN ALLOY OF MAGNESIUM AND CERIUM
Heinz Gawlick, Furth, Bavaria, Gunther Marondel, Erlangen, and Werner Siegelin, Stein bei Nurnberg, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
No Drawing. Filed Oct. 31, 1969, Ser. No. 873,108
Claims priority, application Germany, Nov. 2, 1968, P 18 06 548.0
Int. Cl. C06b *15/00*
U.S. Cl. 149—37 **13 Claims**

Composition of matter suitable for use as an explosive primer or noisemaker comprising:

(a) 20–70 wt. percent of an alloy of cerium and magnesium in the proportion of cerium to magnesium of 4:6 to 8.5:1.5.

(b) 80–30 wt. percent of an inorganic oxidizer for explosives.

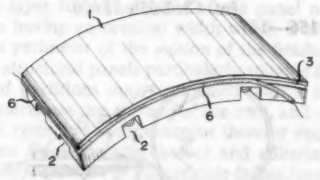
3,671,344
PROCESS OF ETCHING METAL WITH AMMONIUM PERSULFATE WITH RECOVERY AND RECYCLING
John S. C. Chiang, Cranbury, and Bernard J. Hogya, Sayreville, N.J., assignors to FMC Corporation, New York, N.Y.
No Drawing. Filed Dec. 4, 1970, Ser. No. 95,398
Int. Cl. C23f *1/00;* **H05k** *3/00*
U.S. Cl. 156—19 **7 Claims**

Process for etching copper with an aqueous persulfate solution, in which the etching solution is repeatedly reactivated over an extended period of time by repeated removal of metal sulfate values and ammonium sulfate and in which substantial hydrolysis of the persulfate occurs during said extended period. A compound yielding an orthophosphate ion is added to the composition of the etching solution during this period to maintain the total phosphate ion concentration at 0.1 to 0.35 M/l. and at a pH of 1.2 to 1.8.

3,671,345
POROMERIC MATERIAL HAVING A PATENT LEATHER-TYPE FINISH AND PROCESS FOR MAKING
Jon F. Barnes and James L. Johnson, Akron, Ohio, assignors to The General Tire & Rubber Company
No Drawing. Filed Dec. 11, 1969, Ser. No. 884,328
Int. Cl. B32b *5/18*
U.S. Cl. 156—77 **16 Claims**

A process of making a poromeric material with a patent leather-type finish comprising the steps of casting a layer of phase-invertable polymer solution, comprising an extended urethane polymer, a polyvinyl chloride resin, and a water miscible solvent, onto a releasable substrate, placing the layer in a steam atmosphere to phase-invert the solution and to produce a poromeric material with a patent leather-type finish on the side of the material adjacent the releasable substrate, drying and removing the poromeric material from the releasable substrate. This invention also includes the products made by this process.

3,671,346
METHOD OF WATER SEALING SEGMENTS
Yoshiro Tsuzuki, 808 Seijo-cho Setagaya-ku, Tokyo, Japan
Filed Jan. 16, 1969, Ser. No. 792,236
Claims priority, application Japan, Nov. 11, 1968, 43/79,941; Dec. 10, 1968, 43/90,062
Int. Cl. F16l *13/12;* **H05b** *3/10*
U.S. Cl. 156—145 **1 Claim**

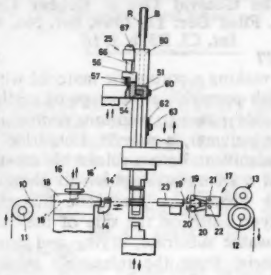


A system for sealing joints between segments arranged beside each other to line a cavity such as a tunnel. Each segment has a grooved side edge abutting an adjoining segment to form a joint therewith. A bituminous material is situated within the groove at the joint and an electrical conductor is also situated in the groove, current being supplied to the conductor for heating the bituminous material so that it will spread and fill the joint. The supply of electrical current to the conductor is then terminated so that the bituminous material will harden in the joint, providing an effective water seal.

3,671,347
METHOD AND APPARATUS FOR ATTACHING A REINFORCING MATERIAL TO A SLIDE FASTENER CHAIN
Keiichi Yoshieda, Kurobe-shi, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 3, 1970, Ser. No. 86,416
Int. Cl. B32b *31/10;* **B65c** *9/36*
U.S. Cl. 156—160 **8 Claims**

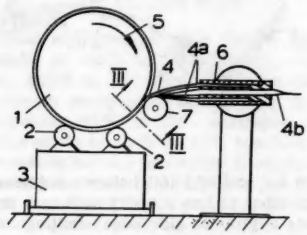
Method and apparatus for attaching a reinforcing material to a slide fastener chain wherein the reinforcing material is secured in position on the slide fastener chain in a series of steps in a mechanical cycle comprising advancing a fastener chain in a horizontal path of travel to a predetermined point at which the mechanical cycle commences, holding a predetermined length of the chain taut in position, positioning a reinforcement strip substantially at right angles to the plane of the chain and moving the said strip transversely across the path of

travel of the chain until it is folded in half on itself around one edge of the space section of the chain, and pressing the reinforcement strip adhesively into position



on the said space section, the said mechanical cycle being coordinated with intermittent advancement of the fastener chain.

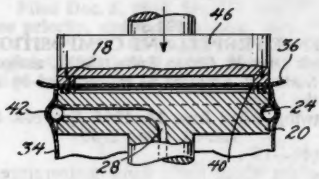
3,671,348
PRODUCTION OF TUBULAR ARTICLES
Kenneth Kemsey-Bourne, Harpenden, England, assignor to English Calico Limited, Manchester, England
Filed Mar. 23, 1970, Ser. No. 21,937
Claims priority, application Great Britain, Mar. 29, 1969, 16,592/69
Int. Cl. B65h *81/00*
U.S. Cl. 156—187 **8 Claims**



The present invention invention relates to improvements in the production of tubular articles produced by forming a strip of a plastics material having an insert embedded therein, helically winding the strip onto a mandrel so that adjacent edge portions overlap, bonding or welding the overlapping edge portions, the improvement being that reinforcing ribs, integral with and angled away from the continuous container wall are formed by using as the insert, a length of profiling strip and forcing a portion of the plastics material of the strip into conformity with a portion of the embedded profiling insert.

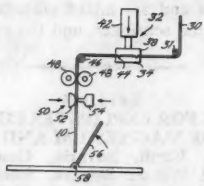
3,671,349
APPARATUS AND METHOD OF MAKING ROUND BOTTOM PLASTIC LINERS FOR SHIPPING CONTAINERS
Edward B. Westlake, Jr., 307 Lincoln Ave., Havertown, Pa. 19203
Filed Aug. 22, 1969, Ser. No. 852,418
Int. Cl. B29c *17/06*
U.S. Cl. 156—229 **5 Claims**

A method of making a removable plastic liner for containers wherein a flexible plastic tubular section is loosely draped over a relatively narrow disc-like mandrel until a relatively short end portion thereof projects beyond the mandrel and mechanically or pneumatically expanding a relatively narrow area of the tubular section at the mandrel to cause the projecting portion to turn inwardly and form a flange to which a bottom sheet can be readily



bonded, the invention making it possible to drape the tubular section over and remove it from the mandrel with relative ease.

3,671,350
METHOD OF PRODUCING A PLASTIC SHOPPING BAG
Edward B. Westlake, Jr., 307 Lincoln Ave., Havertown, Pa. 19203
Filed Dec. 24, 1969, Ser. No. 887,807
Int. Cl. B32b *31/08, 31/20*
U.S. Cl. 156—250 **5 Claims**



Method for making an over-the-arm plastic bag of polyethylene and similar thermoplastic resins which comprises feeding tubular side-gusseted plastic stock through a perforator or cutter station and then through a heat sealing station where a generally rectangular perforated or cut area is produced every two bag lengths in the front and back panels and gussets of the stock and the heat sealing and severing is effected simultaneously transversely of the stock centrally between the perforated or cut areas to form the bottoms of the bags and transversely across and bisecting the perforated or cut area to produce the tops of the bags without opening the welds themselves.

3,671,351
METHOD OF MAKING A MAGNETIC RECORDING MEMBER
Sidney Ties, Stevenage, England, assignor to International Computers Limited, London, England
Filed June 23, 1969, Ser. No. 835,575
Claims priority, application Great Britain, July 9, 1968, 32,713/68
Int. Cl. B44c *1/06*
U.S. Cl. 156—233 **4 Claims**

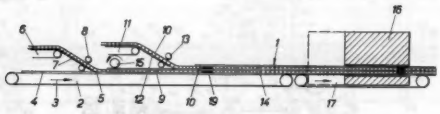
A method for producing a magnetic recording member having a film of magnetic material with a highly finished surface on a backing layer is disclosed. The method includes the steps of preparing a glass disc such that the disc surface is of near optical flatness, depositing a film of magnetic material on the disc, bonding a backing layer to the film and stripping the glass disc from the film to reveal a highly finished surface on the film of magnetic

material, the film being bonded to the backing layer. A two-sided magnetic recording member may be produced by placing two three-layer structures back to back and stripping both glass discs to reveal two highly finished magnetic films.

3,671,352
METHOD FOR MAKING PANTY HOSES
Erik Andersen, Holte, Denmark, assignor to Hans Christian Andersen, Kastanienbaum, Switzerland
Filed June 19, 1969, Ser. No. 834,780
Claims priority, application Denmark, June 20, 1968, 2,941/68
Int. Cl. B32b *31/00*
U.S. Cl. 156—267 4 Claims

A panty hose is made by first seaming the upper portions of two prolonged stockings together and then making a slit through the joined zones of the stockings. According to an embodiment the stockings are placed on elongated forms with pressure feet facing one another, and then the forms or only the pressure feet are pressed together twice, a plate provided with glue being introduced between the stockings the first time.

3,671,353
PROCESS FOR THE CONTINUOUS PRODUCTION OF LAMINATED WOOD OF THE PARQUET TYPE
Leif T. Olsen, Boen, Norway, assignor to Boen Bruk, Kristiansand S., Norway
Filed Mar. 26, 1969, Ser. No. 810,589
Claims priority, application Norway, Apr. 1, 1968, 1,252; June 27, 1968, 2,554; Feb. 11, 1969, 526
Int. Cl. B32b *31/10, 31/20*
U.S. Cl. 156—302 4 Claims

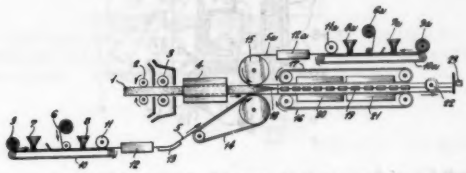


The invention relates to a process for the step by step pressing of material which is fed continuously, particularly wood laminate such as laminated parquet, and the like, in which the pressing is carried out by means of a press which can move to and fro in the feed direction of the material and supported by rollers or wheels. The press carries out the pressing and the heating of the laminate in order to harden the glue while moving in the feed direction of the material and which is open during the return movement, and the press is pushed forward by the material sheet itself and one thereby achieves a desired mutual compression of the lamellae in the horizontal direction.

3,671,354
METHOD OF MAKING RESIN-IMPREGNATED SHEET LAMINATED TO A SUBSTRATE
Toshio Takikawa, Toyonaka-shi, Osaka-fu, Kouji Satomo, Amagasaki-shi, and Takashi Kodama, Nishinomiya-shi, Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan
No Drawing. Filed Nov. 6, 1968, Ser. No. 773,970
Int. Cl. C09j *5/00*
U.S. Cl. 156—306 6 Claims

Method of manufacturing remarkably improved decorative laminate boards by utilizing resin comprising diallyl phthalate prepolymer substantially free from diallyl phthalate monomer, and a polyester composed of specific components in specific amounts; and resin-impregnated sheets in use for the manufacturing of said laminate boards.

3,671,355
CONTINUOUS PRODUCTION OF COMPOSITE PANELS, PARTICULARLY FOR BUILDINGS
Jean Paymal, Clermont, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France
Filed Aug. 12, 1968, Ser. No. 752,043
Claims priority, application France, Aug. 18, 1967, 118,250
Int. Cl. C09j *5/00*
U.S. Cl. 156—324 16 Claims



The continuous production of composite structural panels embodying a continuous core of cellular organic or mineral material, covered on one or more faces and edges thereof with a sheet of heat-hardenable resinous material, preferably reenforced with mineral fibrous material, which is pregelified before its application to the core, and which is subsequently joined to the latter by pressing them together while the resinous material undergoes final polymerization and hardening, preparatory to the controlled cooling thereof and cutting into panels of desired length. The facing layer for all surfaces of the panel may be a unitary one having an original width which is at least as great as the perimeter of the section of the finished panel. Composite structural panels particularly suitable for walls, flooring and partitions may be formed with a facing of ceramic material on one surface of the core, and a sheathing layer of resin and reenforcement therefor encompassing the other three surfaces thereof and adhering to the borders at the underside of the ceramic facing layer. Many improvements in the composite panel and in the mode of manufacture thereof are attained by interposing an intermediate layer of flexible material, such as a foam resin, between the core and the facing layers of the panel.

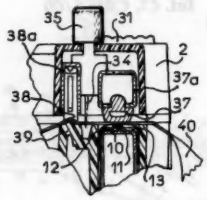
3,671,356
METHOD OF FORMING A PEELABLE SEAL BETWEEN PROPYLENE POLYMER AND A CARBOXYLATED POLYPROPYLENE COATED SURFACE
Henry J. Keinanen, Oak Lawn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed June 8, 1970, Ser. No. 44,505
Int. Cl. C09j *5/00, 7/00*
U.S. Cl. 156—309 11 Claims

A cleanly separable seal between a propylene polymer layer heat sealed to a surface coated with a carboxyl modified polypropylene containing layer is obtained by treating at least one of the layers to be sealed with a normally solid thermoplastic vinyl aromatic polymer or a polar polymer before the two layers are heat sealed together.

3,671,357
APPARATUS FOR WELDING THIN-SHEET PLASTICS MATERIALS
Maurice Marie Achille Trouilhet, Lyon, France, assignor to Calor, Lyon, France
Filed Mar. 4, 1971, Ser. No. 120,992
Claims priority, application France, Apr. 10, 1970, 7013108
Int. Cl. B30b *15/34;* B32b *31/00*
U.S. Cl. 156—359 10 Claims

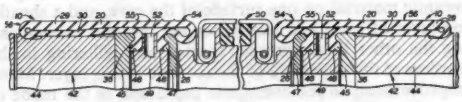
The invention essentially relates to an apparatus for welding thin-sheet plastics materials including support

means secured to a casing and one heating tape stretched upon said support means, said tape having one end connected to a movable element so as to cause the displacement of said movable element during the lengthening of the tape; thermostatic switch means carried by a member



pivotably mounted in said casing; means for actuating the said pivotable member; and a cover hingedly mounted on said casing and provided with means for pressing the said sheets and for cutting them outside the weld line thus formed.

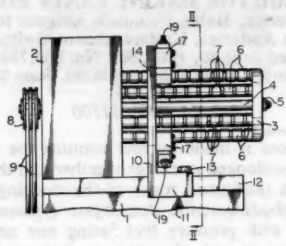
3,671,358
INFLATABLE PLY TURNUP BLADDER FOR A TIRE BUILDING MACHINE
Virgil E. Henley, Akron, and Walter W. Lauer, Canton, Ohio, assignors to The General Tire & Rubber Company
Filed Apr. 2, 1970, Ser. No. 25,182
Int. Cl. B29h *17/22*
U.S. Cl. 156—401 **7 Claims**



A ply turnup bladder for a tire building machine consists of a folded, specially dimensioned, all rubber sleeve which has been molded about a longitudinal axis of symmetry. The sleeve as molded has a uniform cross-section along any one plane normal to its axis and comprises an axially extending outer bladder wall portion of major outside diameter and an axially extending inner wall portion of minor outside diameter, which portions are integrally joined by an annular or circular "fold point." The terminal portions of the sleeve are substantially thickened rings or flanges used to mount the sleeve on a rigid, annular bladder support. The cross-section of the outer bladder wall portion of the sleeve preferably varies in thickness in the axial direction attaining maximum thickness near the fold point of the sleeve. Turnup bladders of this type are structurally simpler, less expensive, and longer lasting than many bladders presently in use.

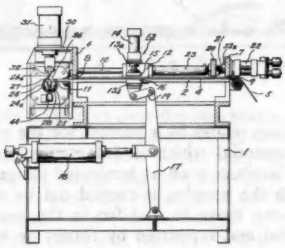
3,671,359
APPARATUS FOR CONTINUOUSLY MAKING A HOSE
Hiroyuki Sawada, 243 Sanjo-cho, Ashiya-shi, Japan; and Saburo Miyawaki, 21–11 Koshienguchikitamachi; and Hajime Ishikawa, 5–25, 2-chome Wakakusa-cho, both of Nishinomiya-shi, Japan
Filed Dec. 23, 1969, Ser. No. 887,673
Int. Cl. B65h *55/04*
U.S. Cl. 156—436 **6 Claims**

An apparatus for continuously making a hose which comprises a plurality of similar rolls each formed with helical grooves thereon and arranged so as to collectively form a cylindrical surface defined by the outer peripheries thereof, the grooves on each of these rolls being disposed so that they are successively axially offset from the grooves on the preceding roll by a dimension derived by dividing the distance between axially adjacent



grooves by the number of the rolls, so that a hard resilient wire supplied into the grooves on the rotating rolls is formed into a coil while a tacky strap of hose wall material is entrained onto the wire, so that the adjacent edges of the tacky hose wall material helically rotating are joined together to thereby form a hose.

3,671,360
APPARATUS FOR FORMING HOLLOW TUBE
Takashi Ochi, Suwahara-Danchi, Japan, assignor to Yayo Plastic Yoki Co., Ltd., Tokyo, Japan
Filed May 5, 1970, Ser. No. 34,646
Int. Cl. B29d *23/10*
U.S. Cl. 156—466 **2 Claims**

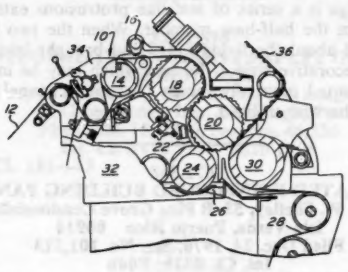


An apparatus for forming hollow tubes wherein a film sheet of resilient and thermo-soluble synthetic resin material is fed into a cylinder body through an elongated axial slot provided on a barrel portion of the cylinder body, and after the film sheet is curled along an inner wall of the cylinder body and its leading edge is overlapped with one side of the film sheet the leading edge is welded to the film sheet and finally the film sheet is sheared at the welded portion.

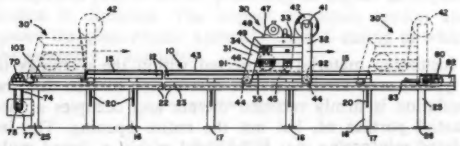
3,671,361
LOW SOUND LEVEL SINGLE FACER MACHINE
Walter C. Morrison, Marlton, N.J., assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed Nov. 9, 1970, Ser. No. 88,043
Int. Cl. B31b *1/20*
U.S. Cl. 156—472 **6 Claims**

A single facer machine is disclosed having bowed flutes on the corrugating rollers. The curvature of the bow of the flutes is chosen so that the middle portion of the flutes is disposed from a line interconnecting the ends of a flute by a distance corresponding to one pitch of

the flutes. This results in the crest of the flutes always being in engagement with a smooth pressure roll, thereby substantially decreasing the high sound level of such machines.



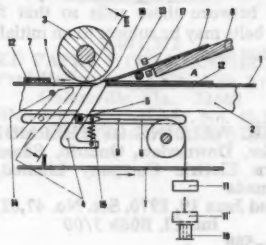
3,671,362
WALL COVERING APPLICATOR
Edwin A. Pierce, Richard W. Knob, and Samuel O. Roth, Piqua, and Emery L. McKinney, Troy, Ohio, assignors to Inland Systems, Inc., Piqua, Ohio
Filed Mar. 30, 1970, Ser. No. 23,812
Int. Cl. B32b *31/10, 31/20*
U.S. Cl. 156—552 2 Claims



Apparatus for applying a continuous sheet of a wall covering material to a wall panel includes a table for supporting the panel in a horizontally disposed position, and a carrier which carries a roll of the covering material, an adhesive spray system, and a machine driven rotatable brush. Rails extend along opposite sides of the table and are engaged by rollers on the carrier, which is moved along the rails by a cable and sheave arrangement. As the carrier moves along the rails, and hence, over the surface of the panel supported on the table, adhesive is sprayed on the panel upper surface, the sheet material is unrolled, and the rotating brush presses the sheet material against the adhesive covered panel surface.

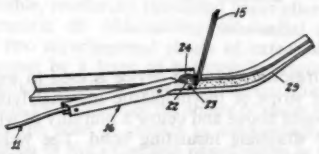
3,671,363
SHEET LAMINATING MACHINE FOR FEEDING LAMINATED SETS TO A PRESS ROLLER
Karl Bruder, Sonnmatt, Walchwil, Switzerland
Filed Mar. 9, 1970, Ser. No. 17,393
Claims priority, application Germany, Mar. 11, 1969, P 19 12 150.7
Int. Cl. B65h *9/14;* B32b *31/20*
U.S. Cl. 156—556 11 Claims

Means for insuring alignment between components of multiple sheets to be laminated. Aligning means consist of a stop engaging the leading edges of the sheets to be laminated as same are fed toward a pressure roller, said stop being moved by said sheets in response to the feeding movement of the sheets themselves toward said roller. Upon reaching said roller the stop is moved downwardly by the roller to a point below the plane of said sheets virtually simultaneously with the commencement of the pressure applying operation by the pressure roller onto said sheets. The stop is then returned to a point of beginning



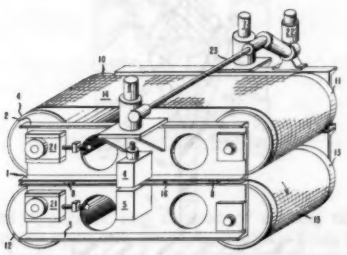
by any convenient means. As soon as it passes beyond the trailing edges of the sheets being laminated it returns to its normal position and is ready for engagement by and guiding of the next following set of sheets to be laminated.

3,671,364
FOAM TAPE APPLICATOR
Joseph C. Guinan, Troy, N.Y., assignor to Norton Company, Troy, N.Y.
Filed July 7, 1970, Ser. No. 52,936
Int. Cl. B32b *31/20, 31/10*
U.S. Cl. 156—574 5 Claims



Apparatus for application of foam tape is provided comprising an elongated, U-shaped body member through which the foam tape is transported and located at one end thereof is an applicator roll for applying the foam tape to a desired member.

3,671,365
APPARATUS FOR COMPRESSING AND COOLING FIBER BATTS
Lloyd W. Cover, Jr., and Charles C. Webb, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 26, 1970, Ser. No. 5,542
Int. Cl. B30b *3/04;* D21f *1/40*
U.S. Cl. 156—580 5 Claims



An apparatus for compressing and cooling fibrous batts that includes spaced movable parallel belts supported by opposed roller support platens and driven by pairs of

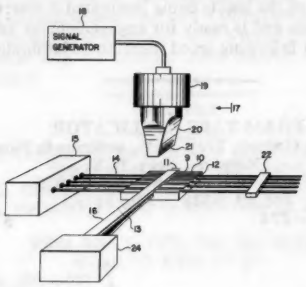
spaced nip rolls. Each roller support platen comprises a plurality of rollers positioned in an overlapping staggered relationship with respect to each other with the opposed platens being positioned in a staggered relationship to each other to reduce belt deflection. An eccentric adjustment means attached to the entrance nip rolls is used to vary the gap between these rolls so that fibrous batts carried by the belts may be subject to an initial momentary high compression load.

3,671,366

ULTRASONIC WELDING OF THERMOPLASTICS

Hugh L. Miller, Downsview, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed June 19, 1970, Ser. No. 47,821
Int. Cl. B06b *3/00*
U.S. Cl. 156—580 4 Claims



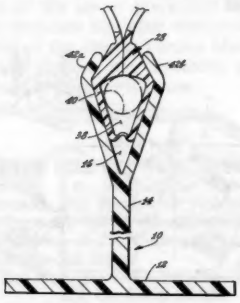
An ultrasonic vibrating device is used to weld together a pair of strips of thermoplastic material lying coplanar and disposed above and below a plurality of wires to form a ladder strapping insulating bond. The welding operation is performed within a molding cavity which restrains any melted plastic from leaking out from between the strips, thereby preventing the formation of flash along the welded edge.

3,671,367

ELONGATED DECORATIVE PLASTIC STRIP HAVING A GREENERY TOPPING SIMULATING FOLIAGE

Wesley S. C. Chin, 3934 S. Bronson Ave., Los Angeles, Calif. 90008, and Kou C. Yao, Culver City, Calif.; said Yao assignor to said Chin

Filed June 12, 1970, Ser. No. 45,793
Int. Cl. A41g *1/00*
U.S. Cl. 161—27 6 Claims



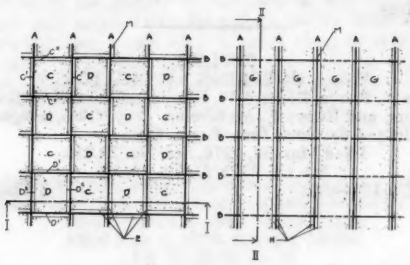
An integrally molded leaf-like decorative strip is provided for insertion in a U-shaped channel member. This strip is molded integrally in the form of a pair of half-base members joined together along a common edge by a living hinge about which said members may be folded. Further, integrally molded with at least one of said half-base members along an edge remote from the common hinged edge is a series of leaf-like protrusions extending away from the half-base member. When the two halves are folded about the living hinge and brought into abutment a decorative strip is formed which may be inserted in a supported upwardly facing U-shaped channel member, or otherwise utilized.

3,671,368

INSULATED REINFORCED BUILDING PANEL

Shelley W. Shelley, 53–B Pine Grove Condominium, Isla Verde, Puerto Rico 00914

Filed Dec. 24, 1970, Ser. No. 101,213
Int. Cl. B32b; E04b
U.S. Cl. 161—38 16 Claims



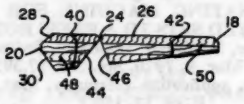
Insulating material is inserted within the openings of a typical wire mesh concrete reinforcing mat so that the insulation is firmly retained therein and occupies a substantial portion of, but not the entire opening. The insulated reinforcing mat is disposed within a closed mold of a configuration suitable for preparing a panel, and concrete or other suitable moldable building material is poured by gravity into the mold while the mold is inclined at an angle which preferably is about 30 to 90 degrees with respect to the horizontal.

3,671,369

UNIVERSAL MOLDING STRIP FOR TRIMMING

Andrew M. Kvalheim, Petaluma, and Howard M. Wassem, Rohnert Park, Calif., assignors to Aim Products, Inc., Petaluma, Calif.

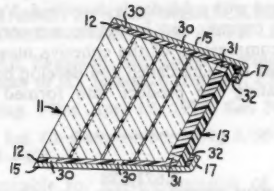
Filed May 6, 1970, Ser. No. 35,075
Int. Cl. B32b *3/10*; E04c *2/40*; E04f *19/02*
U.S. Cl. 161—40 5 Claims



A multi-use molding strip for trimming comprising a pair of stock pieces, each of indeterminate length, and a flexible elastic decorative laminate joining the stock pieces together. Each stock piece includes inner walls facing each other diverging away from the elastic laminate so that the stock pieces may be rotated about a longitudinal axis defined by the junction of the laminate with the inner

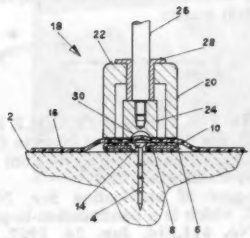
walls to accommodate a surface being trimmed. The strip may serve as a baseboard, ceiling corner trim, doorway molding, or as a wainscoting cap, to name a few uses.

3,671,370
INTEGRAL TRANSPARENT SAFETY GLASS ARMOR UNIT
Harry E. Littell, Jr., Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed June 15, 1970, Ser. No. 46,336
Int. Cl. F41h *5/26*; B32b *1/06*
U.S. Cl. 161—43 **7 Claims**



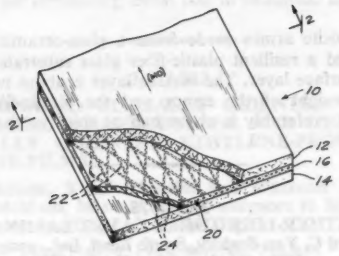
A transparent safety glass assembly comprising a laminated glass-plastic assembly comprising a plurality of alternate plies of glass and thermoplastic transparent interlayers of plasticized polyvinyl butyral arranged to provide an impact striking section, a transparent polyurethane plasticized in situ to provide a transition section and a transparent polycarbonate providing an impact absorption section is disclosed. The impact transition section also spaces the glass-plastic assembly from a casing in which the assembly is mounted.

3,671,371
DEVICE FOR ATTACHING A THERMOPLASTIC FOIL TO A SUPPORTING STRUCTURE
Emanuel Wolf, Horgen, Switzerland, assignor to Ironflex AG, Zurich, Switzerland
Original application Sept. 5, 1967, Ser. No. 665,393, now Patent No. 3,562,054, dated Feb. 9, 1971. Divided and this application Feb. 19, 1970, Ser. No. 12,689
Claims priority, application Switzerland, Sept. 7, 1966, 12,961/66; Sept. 26, 1966, 13,865/66
Int. Cl. B32b *7/08*
U.S. Cl. 161—43 **6 Claims**



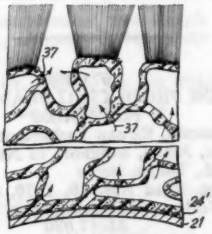
A device for attaching a thermoplastic foil at a supporting structure wherein the foil is heat sealed or welded to a holding plate formed by a metallic core and a thermoplastic cover layer. The holding plate is rigidly connected to the supporting structure and subsequently the foil is placed over the holding plate. Welding heat is generated by creating a high frequency field between the metallic core of the holding plate and an electrode placed on the side of the foil facing away from the holding plate. The metallic core of the holding plate forms a counter electrode.

3,671,372
LAMINATED PAPER WITH REINFORCING SCRIM
Paul Hoffman, 714 SW. 16th Ave., Gainesville, Fla. 32601
Filed Apr. 27, 1970, Ser. No. 32,275
Int. Cl. B29h *9/04*; B32b *5/04*
U.S. Cl. 161—58 **16 Claims**



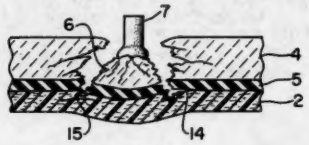
An extensible, reinforced laminated paper sheet having the characteristic of withstanding substantial impacts, formed by two superimposed sheets of extensible paper bonded together by a layer of hot-melt laminant having a scrim of polyester fibers embedded therein which transmits stretching forces through the sheets of paper to points remote from the zone of impact to substantially reduce the deformation of the extensible paper sheets in the area of impact.

3,671,373
PAINT APPLICATOR OR THE LIKE AND METHOD OF MAKING THE SAME
Josef Grewe, Hagerstown, Md., assignor to Electra Flock, Inc., New York, N.Y.
Filed Aug. 11, 1970, Ser. No. 62,844
Int. Cl. B44d *3/00*
U.S. Cl. 161—64 **14 Claims**



A paint applicator and method of making the same comprising an open-cell, yieldable synthetic foam backing material having flock adhesively secured directly to the foam surface, providing a free-flow path between the flock and the interior of the foam matrix. The invention relates further to a method of making an applicator or the like having the above described characteristics.

3,671,374
COMPOSITE ARMOR
Robert V. Kolarik, North Canton, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio
Filed May 20, 1970, Ser. No. 39,951
Int. Cl. B32b *17/04, 17/10, 17/12*
U.S. Cl. 161—93 2 Claims



Composite armor made from a glass-ceramic surface layer, and a resilient plastic-fiber glass substrata secured to the surface layer. The surface layer is about two-thirds of the weight of the armor and the plastic-fiber glass substrata preferably is about half as thick as the surface layer.

3,671,375
LEATHER-LIKE THREE LAYER LAMINATE
Edward C. Van Buskirk, South Bend, Ind., assignor to Uniroyal, Inc., New York, N.Y.
No Drawing. Original application Feb. 26, 1969, Ser. No. 802,636, now Patent No. 3,574,021, dated Apr. 6, 1971. Divided and this application Oct. 9, 1970, Ser. No. 79,632
Int. Cl. B32b *5/14, 5/18*
U.S. Cl. 161—159 3 Claims

A novel, breathable, leather-like three layer laminate is produced having a fabric backing layer, an intermediate breathable sponge layer and an upper breathable surface layer by a method in which a substantially uniform mixture of a fluid organic plastic film forming material and a meltable material incompatible therewith is formed into a thin surface layer, there is formed on the thin layer a thicker body layer from a substantially uniform mixture of a fluid organic plastic film forming material containing a meltable material incompatible therewith, and a blowing agent, with said incompatible meltable material in each said layer being in a physical form having a bulk density less than its actual density, a fabric is applied to the body layer, the film forming material in the two layers is formed into a unitary film bonded to the fabric, the body layer is sponged by decomposing a blowing agent, and the incompatible material in the two layers is melted after a matrix has been formed of the two layers.

3,671,376
METHOD FOR PRODUCING FLAME-RETARDANT PLYWOODS
Takayoshi Okazaki, Kiroku Tashiro, and Koichiro Yanagida, Tokyo, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan
No Drawing. Filed Apr. 10, 1970, Ser. No. 27,428
Claims priority, application Japan, June 30, 1969, 44/51,030
Int. Cl. B32b *9/06, 21/14*
U.S. Cl. 161—165 10 Claims

A method for rendering plywood flame-retardant using a difficulty-soluble phosphate whereby in a first embodiment, a paper sheet, plastic film or wooden sheet is bonded to the plywood with an adhesive containing said difficulty-soluble phosphate and in a second embodiment, a paper sheet is impregnated with said difficultly-soluble ammonium polyphosphate and is bonded to said plywood.

3,671,377
RIGID COMPOSITE PRODUCTS AND PROCESS FOR THE PREPARATION THEREOF
Alan A. Marra, 915 Sunset, Ann Arbor, Mich. 48103
Continuation-in-part of application Ser. No. 660,806, Aug. 15, 1967. This application July 29, 1970, Ser. No. 59,239
The portion of the term of the patent subsequent to Jan. 19, 1988, has been disclaimed
Int. Cl. B29j *5/00;* B32b *21/02*
U.S. Cl. 161—162 10 Claims

A process for the preparation of rigid composite products with similar physical characteristics in all dimensions or directions from a three dimensional skeletal structure formed of randomly oriented elongate sticks with multiple fibrous projections which maintain the elongate sticks in a loosely cohesive mass which is shaped or molded and made rigid with a binder is described. Various liquid binders both organic and inorganic are used which do not require compression of the cohesive mass and liquid binder in order to be hardened and develop bond strength for consolidating the product into formed or molded shapes.

3,671,378
GLASS FIBER REINFORCED COMPOSITE AND METHOD OF MAKING SAME
Massimo Baer, Longmeadow, and Joseph O. Campbell, Agawam, Mass., assignors to Monsanto Company, St. Louis, Mo.
Filed Nov. 4, 1969, Ser. No. 873,952
Int. Cl. B32b *5/16;* D02g *3/36*
U.S. Cl. 161—170 18 Claims

Disclosed herein is an improvement in the process for preparing composites from glass fibers and thermoplastic resins which comprises blending the thermoplastic resin matrix with glass concentrate capsules comprising 10 to 80% by weight of glass strands having a length in the range of from 1/32 to 3/4 inch, preferably from about 1/8 to about 1/4 inch, which strands are arranged in a collimated array and encapsulated within a thermoplastic resin matrix, wherein the individual fibers of the strands, the individual strands in the collimated array and the collimated array of glass strands are encapsulated in the thermoplastic resin matrix.

3,671,379
COMPOSITE POLYESTER TEXTILE FIBERS
Evan Franklin Evans, Kinston, and Norwin Caley Pierce, Greenville, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 747,420, July 10, 1968, which is a continuation-in-part of application Ser. No. 611,314, Jan. 24, 1967, which is a continuation-in-part of application Ser. No. 462,992, June 10, 1965, which in turn is a continuation-in-part of application Ser. No. 384,831, July 24, 1964. This application Mar. 9, 1971, Ser. No. 122,316
Int. Cl. D02g *3/02*
U.S. Cl. 161—173 18 Claims

Helically crimpable and crimped bicomponent filaments comprising a laterally eccentric assembly of at least two synthetic polyesters. At least one of the components is

a partly crystalline polyester in which the chemical repeat-units of its crystalline region are in a non-extended stable conformation that does not exceed ninety percent of the length of the conformation of its fully extended chemical repeat-units and is generally on the inside of the crimp helices formed when the assembly crimps, while at least one other polyester component is partly crystalline and the chemical repeat-units of the crystalline region more closely approach the length of the conformation of its fully extended chemical repeat-units. Yarns, fabrics, and the like produced from these filaments have a wide range of end uses.

3,671,380

UV TRANSMITTING BOROSILICATE GLASS COMPOSITION AND ARTICLE

Mir Akbar Ali, Evanston, and Alexis G. Pincus, Chicago, Ill., assignors to IIT Research Institute, Chicago, Ill.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,012

Int. Cl. C03c *13/00*; D02g *3/00*
U.S. Cl. 161—175 **4 Claims**

A glass suitable for the transmission of radiation in the near ultraviolet region and having a relatively low index of refraction rendering the glass suitable for cladding glass in the manufacture of ultraviolet transmitting composite fibers. The glass is composed of B_2O_3, SiO_2, Al_2O_3, and K_2O and is substantially free of ultraviolet absorbers.

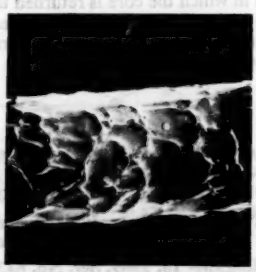
3,671,381

ETCHED AND RIDGED POLYAMIDE MONOFILAMENT

John Edward Hansen, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 834,213, June 9, 1969, which is a continuation-in-part of application Ser. No. 616,956, Feb. 17, 1967, and a continuation-in-part of application Ser. No. 673,287, Oct. 6, 1967. This application Sept. 2, 1970, Ser. No. 69,181

Int. Cl. D01f *7/06*
U.S. Cl. 161—180 **4 Claims**



Polyamide monofilament with a surface which is irregularly ridged in a direction predominantly transverse to the length of the filament, as well as etched. A method for production thereof comprising passing filament through a tube under 100–150 p.s.i.g. of steam for 0.1–10 seconds. Such filaments are useful in brushes and textiles.

3,671,382

WATER AND HEAT RESISTANT ADHESIVE

Andrew Earl Pierce, Grand Island, N.Y., assignor to Borden Inc., New York, N.Y.

No Drawing. Filed June 17, 1970, Ser. No. 47,154

Int. Cl. B32b *15/08*; C09j *3/24*; C08f *45/24*
U.S. Cl. 161—214 **11 Claims**

An aqueous adhesive dispersion containing: casein; a reactive copolymer of vinyl acetate with either methylol acrylamide, a (lower) unsaturated aliphatic acid or a mixture of said acrylamide and acid copolymers: a copolymer of vinyl acetate with a (lower) alpha-olefin; an acid generating salt having a volatile component; a phenylsulfonamide plasticizer for casein; and a sufficient quantity of a volatile alkalizing agent to impart a pH of about 6.5 to 7.5 to said dispersion. The dispersion can be used for laminating metal foil to cellulosic materials.

3,671,383

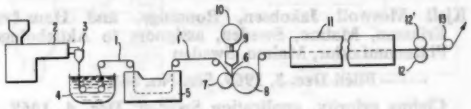
LAMINATED BIAXIALLY ORIENTED ISOTACTIC POLYPROPYLENE AND UNIAXIALLY ORIENTED ETHYLENE-PROPYLENE-FILMS

Rikita Sakata, Kohei Masuda, and Masanori Takashi, Yokkaichi-shi, Mie-ken, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1968, Ser. No. 772,957

Claims priority, application Japan, Nov. 4, 1967, 42/70,868

Int. Cl. B32b *27/08*
U.S. Cl. 161—252 **2 Claims**



A heat-sealable laminated polypropylene film composed of a biaxially oriented isotactic polypropylene film and at least one uniaxially oriented ethylene-propylene copolymer film containing at least 75% by weight propylene. A process for the production of such a laminated polypropylene film.

3,671,384

GLASS CONCENTRATE CAPSULES

Massimo Baer, Longmeadow, and Joseph O. Campbell, Agawam, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 4, 1969, Ser. No. 873,799

Int. Cl. D02g *3/36*
U.S. Cl. 161—170 **21 Claims**

Disclosed herein are glass concentrate capsules useful in forming reinforced thermoplastic resin composites, said

capsules comprising 10 to 80% by weight of glass strands having a length of from 1/32 to 3/4 inch which strands are arranged in a substantially collimated array within a thermoplastic resin matrix, wherein the individual strands in the collimated array and the collimated array of glass strands are encapsulated in the thermoplastic resin matrix.

3,671,385

FIBROUS CARBONACEOUS COMPOSITES AND METHOD FOR MANUFACTURING SAME

Paul E. Trent, Andersonville, and James E. Miner, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed July 17, 1970, Ser. No. 55,953

Int. Cl. D21h 5/18

U.S. Cl. 162—152 10 Claims

Carbonaceous composites are prepared by spraying an aqueous slurry containing discrete graphite fibers, a carbonizable resin in particulate form, and a water-soluble starch onto a porous mandrel coupled to a vacuum source for drawing off excess water from the formed structure. This structure is then heated to a temperature sufficient to carbonize the starch and the resin for providing binders which join together the fibers.

3,671,386

PRODUCING TUBULAR MEMBERS OF LIGNOCELLULOSE MATERIAL BY COMPRESSION WITHIN AN ANNULAR CHAMBER

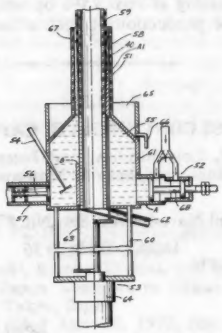
Kjell Moswoll Jakobsen, Ronninge, and Hans-Ivar Eriksson, Malmo, Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden

Filed Dec. 3, 1969, Ser. No. 881,816

Claims priority, application Sweden, Dec. 4, 1968, 16,549/68

Int. Cl. D21j 3/04

U.S. Cl. 162—224 15 Claims



A method and apparatus for making tubular members wherein a slurry of a liquid and a lignocellulose material is reciprocatingly compressed in a vertically aligned dewatering chamber of annular cross-section. The compression takes place in a vertical direction and the drainage openings are angled such that the extracted liquid does not repass through the tubular member being formed. The tubular product is then placed in a mould where it undergoes radial compression at a pressure of from 10 to 100 atmospheres and is heated to a temperature of 50 to 250° C. to thermoset the lignocellulose material.

3,671,387

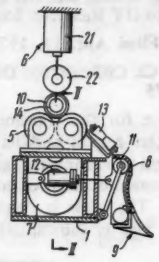
UNIT FOR CALENDERING PIPES AND EXTRACTING CORES THEREFROM IN A MACHINE FOR PRODUCING FIBROCEMENT PIPES

Isaak Pavlovich Abardovsky, 3 Pryadilnaya ulitsa 8, kv. 24, and Lev Alexandrovich Gertsman, 1 Dmitrovsky proezd 6, korpus 1, kv. 95, both of Moscow, U.S.S.R.

Filed Aug. 14, 1969, Ser. No. 850,106

Int. Cl. B31c 1/00, 3/00

U.S. Cl. 162—284 6 Claims



A machine for producing fibrocement pipes comprises an apparatus for calendering pipes and for extracting a core therefrom including a beam having a longitudinal axis and pivotable about the axis in opposite directions. Driven rollers of a calendering mechanism are mounted on the beam, and an undriven calendering roller is mounted adjacent the beam to calender a pipe supported on the driven rollers. After calendering of the pipe, the beam is pivoted to a position in which a pivotal chute on the beam can receive the calendered pipe, a lever system being coupled to the support chute to oscillate the same. An extractor head removes the core from the calendered pipe when the pipe is supported in the chute whereafter the beam undergoes reverse rotation and the calendered pipe is removed from the chute. The beam is then rotated to a position in which the core is returned to the beam and supported by biconical rollers on the beam whereafter the core is removed and the beam is further rotated to initial position.

3,671,388

PAPER MACHINE INCLUDING A HORIZONTAL SUCTION FORMING CYLINDER HAVING MULTIPLE DEWATERING AREAS THEREON

Erik A. Nykopp, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

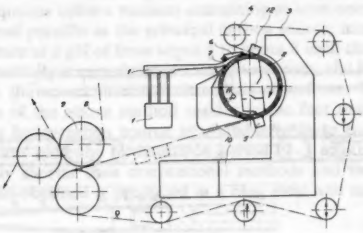
Filed July 18, 1969, Ser. No. 843,144

Int. Cl. D21f 1/60; D21h 1/06

U.S. Cl. 162—304 7 Claims

The paper machine comprises a horizontal cylinder, a slurry feed box opening onto the top side of the cylinder and the upper rim of the feed slice of which has been continued in order to form a roof-like upper lip between the feed slice and a feed roll placed on the cylinder at an appropriate distance from the feed box in the direction of slurry flow, an endless felt or wire running from the feed roll along the cylinder towards the lower part

of the same, an appropriate number of guiding and tension rolls for conducting said felt or wire back to the feed roll, a suction box or suction roll placed on the side of the feed roll opposite to that facing the cylinder and at the point where the slurry web and felt or wire depart from the cylinder surface, and possibly a compressed air box or equivalent placed above the felt or wire and after the feed roll, as seen in the direction of travel of the wire, approximately coincident with the gap remaining between the roof-like upper lip of the feed box and



the wire. The horizontal cylinder is a suction cylinder which has therein a suction zone extending substantially from and including the upper roof-like lip continuously to the suction box or suction roll. The upper roof-like lip and suction cylinder form a first drying area for the slurry to form a partially dewatered web while the belt thereafter contacts the web against the surface of the suction cylinder over a major portion of the descending surface of the suction cylinder to form a second drying area in which suction and centrifugal force act upon the web to remove additional water.

3,671,389

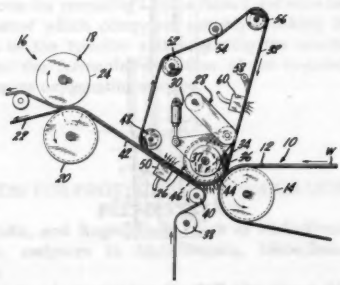
APPARATUS FOR TRANSFERRING A WEB FROM THE FORMING SECTION TO THE PRESS SECTION IN A PAPERMAKING MACHINE

P. Borje Wahlstrom, Rosemont, and J. Eric Adamson, Lionville, Pa., assignors to A. Johnson & Co., Inc., New York, N.Y.

Filed Jan. 22, 1970, Ser. No. 4,936

Int. Cl. D21f 2/00

U.S. Cl. 162—306 **6 Claims**



Apparatus for transferring a wet paper web from the downstream end of a Fourdrinier wire to a press section comprises a suction transfer roll that runs within an endless, open-mesh transfer fabric and picks the web off the Fourdrinier wire. The web is transferred from the transfer fabric onto a horizontal or inclined run of a carrier belt which is led in closely adjacent the wire section of the machine and into proximity with the transfer roll. The carrier rolls for the transfer fabric are arranged to guide the transfer fabric along a path conjoint with a portion of the run of the carrier belt from the transfer roll to the first press, the transfer fabric being led away from the run of the carrier belt at a location intermediate the transfer roll and the first press of the machine press section. At a location along the conjoint run of the carrier belt and the transfer fabric, a suction box creates a differential pressure across the web to transfer it from the transfer fabric onto the carrier belt so that it runs with the carrier belt to the press section.

3,671,390

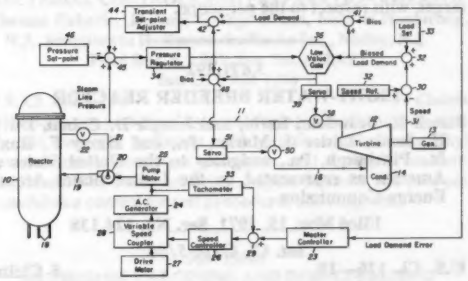
FAST INITIAL RESPONSE NUCLEAR REACTOR CONTROL SYSTEM

John J. Hogle, Los Gatos, Calif., assignor to General Electric Company

Filed Feb. 14, 1969, Ser. No. 799,275

Int. Cl. G21c 7/32

U.S. Cl. 176—24 **6 Claims**



A control system for boiling moderator-coolant nuclear reactors giving fast response to load changes is disclosed. In this system, the broad operating level of the reactor is set by adjusting the control rods. Then, the reactor operating level is adjusted to follow load requirements by changing the coolant recirculation flow rate. In order to provide fast initial response to rapid load changes an arrangement is provided cooperating with the recirculation flow control to lower the pressure regulator set point when steam demand increases so that reactor internal pressure is temporarily decreased causing increased steam generation due to flashing and sending more steam to the load. A cooperating bypass system is provided to accommodate large sudden decreases in the load steam requirements.

3,671,391

PERISCOPE STADIMETER SIMULATOR WITH CAMERA SWEEP DELAY

Carl R. Driskell, Winter Park, Fla., assignor to the United States of America as represented by the Secretary of the Navy

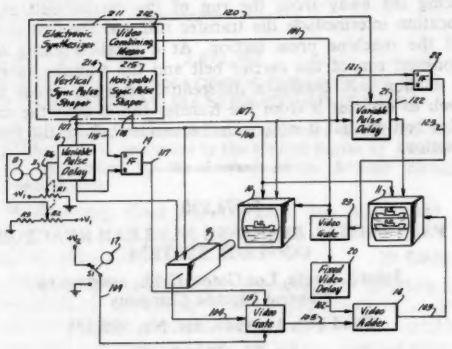
Filed Dec. 7, 1970, Se. No. 95,595

Int. Cl. H04n 7/18; G09b 9/06

U.S. Cl. 178—6.8 **5 Claims**

In a training device having a periscope view simulator wherein a view seen through a periscope is synthesized

and displayed on a monitor TV screen, means are provided for presenting a "ghost" image on the screen. The ghost image stimulates the image seen through a periscope when a stadimeter built into the periscope is used to determine the range of a ship or other possible torpedo target, with respect to the periscope.



3,671,392

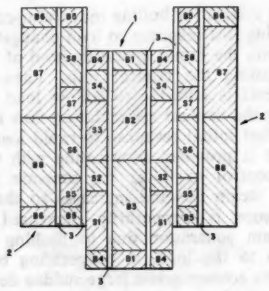
LIGHT-WATER BREEDER REACTOR

Benoit R. Beaudoin, Irwin, and Joseph D. Cohen, David H. Jones, Lester J. Marier, Jr., and Harry F. Raab, Jr., Pittsburgh, Pa., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 15, 1971, Ser. No. 124,138

Int. Cl. G21c *5/00*

U.S. Cl. 176—18 **5 Claims**



A light-water-moderated and -cooled nuclear breeder reactor of the seed-blanket type characterized by core modules comprising loosely packed blanket zones enriched with fissile fuel and axial zoning in the seed and blanket regions within each core module. Reactivity control over lifetime is achieved by axial displacement of movable seed zones without the use of poison rods in the embodiment illustrated. The seed is further characterized by a hydrogen-to-uranium-233 atom ratio in the range 10 to 200 and a uranium-233-to-thorium-232 atom ratio ranging from 0.012 to 0.200. The seed occupies from 10 to 35 percent of the core volume in the form of one or more individual islands or annuli.

3,671,393

NUCLEAR REACTOR FUEL ELEMENTS

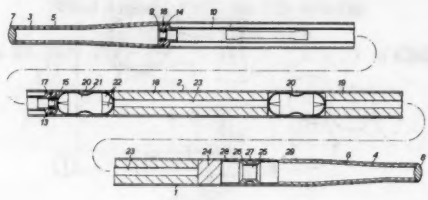
Albert Etheridge Williams, Blackpool, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 11, 1969, Ser. No. 848,788

Claims priority, application Great Britain, Aug. 29, 1968, 41,344/68

Int. Cl. G21c *3/18*

U.S. Cl. 176—73 **4 Claims**



A nuclear reactor fuel element comprises nuclear fuel material enclosed in a protective sheath, a number of spacer members being provided in the sheath dividing the fuel material into longitudinal segments. The ends of the spacer members are longitudinally crushable enabling the fuel segments to expand in the longitudinal direction of the sheath to avoid swelling of the sheath by radial expansion of the fuel segments.

3,671,394

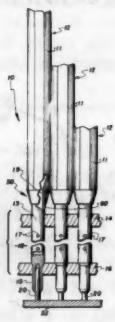
ARTICULATED FUEL ELEMENT HOUSING

Louis Bernath, Canoga Park, and Joseph V. Facha, Reseda, Calif., assignors to North American Rockwell Corporation

Filed Dec. 29, 1969, Ser. No. 888,244

Int. Cl. G21c *3/10*

U.S. Cl. 176—79 **5 Claims**



An articulating ball joint integral with and near the base of a plurality of nuclear reactor fuel elements to compensate for bowing distortions and stresses caused by an adverse thermal environment within the core of a reactor which allows for a slight misalignment minimizing component stresses in the housing of each of the fuel elements.

3,671,395

METHOD FOR PRODUCING CITRIC ACID

Hideo Fukuda, Osaka; Takashi Suzuki, Takarazuka; Yasuhiro Sumino, Kobe, and Shunichi Akiyama, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 30, 1970, Ser. No. 7,232
Claims priority, application Japan, Jan. 30, 1969, 44/6956
Int. Cl. C12d *13/00*
U.S. Cl. 195—28 R 11 Claims

Method for producing citric acid which involves inoculating a citric acid-accumulating and hydrocarbon-assimilating strain of bacterium belonging to the genus Corynebacterium in an aqueous culture medium containing at least one C_9–C_{20} — normal paraffin as the principal carbon source; incubating the culture at a pH of from about 5 to about 8 until citric acid is substantially accumulated in the culture broth; and recovering the the so-accumulated citric acid therefrom. The advantage of the above method resides in the fact that the n-paraffin hydrocarbon source is available in large quantities and at low cost; the fermentation period (2–3 days) is considerably shorter than conventional methods and the citric acid thus-obtained is produced in a high yield and in a pure form.

3,671,396

PREPARATION OF L-ISOLEUCINE BY FERMENTATION

Kiyoshi Nakayama, Sagamihara-shi, and Hiroshi Hagino, Hachioji-shi, both of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed March 5, 1969, Ser. No. 804,696
Claims priority, application Japan, March 13, 1968, 43/15903
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 R 13 Claims

L-isoleucine is prepared by culturing a hydrocarbon assimilable microorganism in a culture medium containing hydrocarbon as the main carbon source and α-aminobutyric acid, hydroxybutyric acid, threonine or mixtures thereof or non-toxic salts thereof. Microorganisms of the genera Corynebacterium, Brevibacterium, Arthrobacter, Micrococcus, Pseudomonas, Nocardia, Streptomyces, etc., are particularly suitable for use in the process.

3,671,397

METHOD OF PREPARING L-DOPA

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 826,003, May 19, 1969, abandoned. This application Sept. 29, 1969, Ser. No. 862,061
Int. Cl. C12d *13/06*
U.S. Cl. 195—29 17 Claims

A process for preparing L-dopa from L-tyrosine and derivatives thereof which comprises suitably blocking the amino function of the tyrosine and subjecting the resulting compound to the fermentative action of an organism which elaborates an oxygenating enzyme.

3,671,398

PROCESS FOR PRODUCING POLYSACCHARIDES BY FERMENTATION

Pierre Colin, and Roger Merle, both of Melle(Deux-Sevres), France, assignors to Melle-Bezons, Melle(Deux-Sevres), France

Continuation-in-part of Ser. No. 717,439, March 24, 1968, abandoned. This application Sept. 14, 1970, Ser. No. 72,157
Claims priority, application France, April 3, 1967, 101218
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 P 7 Claims

A process for producing polysaccharides by fermentation of carbohydrates in a fermentation bath with microorganisms of the class Xanthomonas in which the broth is formulated to contain a source of nitrogen selected from the group consisting of lactoserum or lactoserum and cereal bran in amounts corresponding to 5 to 15 grams of lactoserum on a dry solids basis per liter of broth when used alone, or 3 to 7 grams of lactoserum and 4 to 8 grams per liter of cereal bran when both are present in the broth as a source of nitrogen.

3,671,399

POLYANIONIC COMPOUNDS IN CULTURE MEDIA

Thomas Cekoric, Jr., Belleville; George Evans, Hopatcong, and Ronald Searcy, Upper Montclair, all of N.J., assignors to Hoffman-La Roche & Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 691,585, Jan. 15, 1968, abandoned. This application Aug. 30, 1968, Ser. No. 756,427
Int. Cl. C12k *1/00*
U.S. Cl. 195—100 22 Claims

Sulfated polysaccharide, polyethylene sulfonic acid, polyvinyl sulfuric acid, polystyreme sulfonic acid, a sulfate ester of a polyethylene ether of an aliphatic alcohol having from 12 to 18 carbon atoms, monothioglycerol or sulfated naphthalene are combined with a bacterial culture medium. These compositions inhibit the antibacterial components of contaminated body fluids, thereby allowing the contaminant bacteria to grow freely.

3,671,400

BACTERIAL CONTROLS AND PREPARATION THEREOF

Thomas Cekoric, Jr., and George Evans, both of Hopatcong, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 5, 1969, Ser. No. 882,691
Int. Cl. C12k *1/08*
U.S. Cl. 195—100 14 Claims

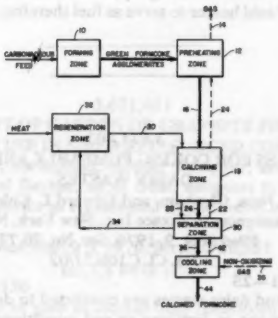
Bacteria are preserved by centrifuging a broth culture, mixing the bacterial sediment with gelatin, diethylaminoethyl dextran and monosodium glutamate, and drying at ambient temperature on a non-adhering support surface. The product is useful as a control for test procedures and reagents.

3,671,401

METHOD OF CALCINING AND DESULFURIZING CARBONACEOUS CONTIGUOUS BED OF AGGLOMERATES WITH PARTICULATE HEAT CARRIERS

Everett Gorin, Pittsburgh, Pa., assignor to Consolidated Coal Company, Pittsburgh, Pa.

Filed July 9, 1970, Ser. No. 53,370
Int. Cl. C10b *49/18, 53/08, 57/12*
U.S. Cl. 201—12 7 Claims



An improved process for calcination of agglomerates to produce coke suitable for use in ore reduction furnaces, wherein calcination is effected simultaneously in at least two different heat transfer zones, in one of which gas is the prin-

cipal source of heat and in the other of which solids are the principal source of heat. A stream of hot finely divided solid heat carriers are showered downwardly through the interstices of said downwardly moving bed consisting essentially of a column of contiguous, preheated agglomerates in the calcining zone at a velocity which is greater than that of said downwardly moving bed, the temperature of said heat carrier being higher than that of said agglomerates.

3,671,402

FLUIDIZING BED COKING METHOD OF BROWN COAL

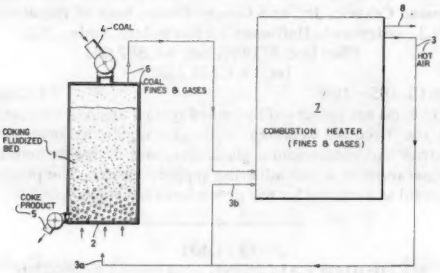
Werner Wenzel, Aachen, and Hans Penning, Cologne Lindenthal, both of Germany, assignors to Rheinische Braunkohlenwerke AG, Koln, Germany

Filed April 29, 1970, Ser. No. 32,891

Claims priority, application Germany, April 29, 1969, P 19 21 710.8

Int. Cl. C10b *49/10*

U.S. Cl. 201—15 **6 Claims**



For the coking of brown coal, lignite or the like there is provided a coking system which includes a coking apparatus and an associated heater from which hot air is introduced into the coking apparatus. One part of the fine grained portion of the charge mixed with gases derived from the coking process is introduced from the coking apparatus into the combustion chamber of said heater to serve as fuel therefor.

3,671,403

PROCESS FOR COKING PUMPABLE ANIMAL AND DAIRY WASTES

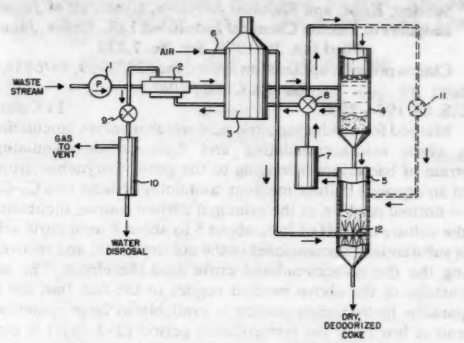
Howard V. Hess, Glenham, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 9, 1970, Ser. No. 70,775

Int. Cl. C10b *53/02*

U.S. Cl. 201—25 **5 Claims**

Animal and dairy wastes are converted to deodorized coke suitable for use as fertilizer or soil conditioner, an aqueous odor-free effluent having low chemical oxygen demand and reduced phosphorus content and an odorless gas suitable for discharge to the atmosphere. The wastes are coked in the liquid phase under pressure to produce wet coke and a malodorous, gas-containing effluent high in chemical oxygen demand. The wet coke is treated with pressurized hot air to remove liquids therefrom and the air stream is mixed with the effluent and the mixture is oxidized, brought into heat exchange relationship with incoming wastes and then discharged.



3,671,404

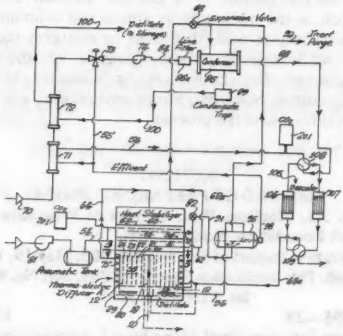
PELTIER EFFECT CONCENTRIC STILL WITH HIGH TEMPERATURE HEAT SUPPLYING MEANS

Milton Meckler, 16348 Tupper Street, Sepulveda, Calif.

Continuation-in-part of Ser. No. 381,588, July 9, 1964, Pat. No. 3,393,130. This application July 12, 1968, Ser. No. 744,485

Int. Cl. B01d *1/22*; **B08b** *9/00*

U.S. Cl. 202—176 **14 Claims**



A thermoelectric diffusion still including a concentric series of sections which sections are closely spaced to define annular diffusion spaces therebetween. A series of thermoelectric elements are positioned within such sections providing heated and cooled surfaces, respectively, on opposite sides of the section as well as facing each other across the spaces to evaporate and condense a feed fluid. Means are provided for collecting condensate from the opposite surface of each of the sections.

3,671,405

METHOD OF ELECTROFORMING ON SURFACES HAVING PROJECTIONS

Michael Mattia, Upper Darby, Pa., assignor to The Budd Company, Philadelphia, Pa.

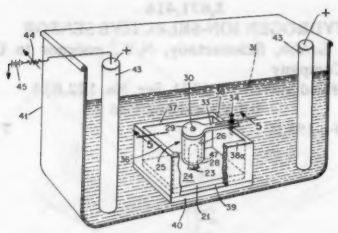
Filed Dec. 7, 1970, Ser. No. 95,548

Int. Cl. C23b *7/00, 5/00*

U.S. Cl. 204—4 **3 Claims**

A method of electroforming on surfaces having relatively high projections by providing a shield of electrically non-con-

ductive material to encircle a portion of the length of the pro-



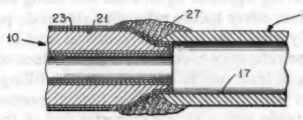
jection and thereafter periodically raising the shield at a rate corresponding to the rate of deposition on the projections.

3,671,406

METHOD OF JOINING DISSIMILAR METALS BY PLATING

Michael Mattia, Upper Darby, and Herbert D. Van Sciver, II, Merion, both of Pa., assignors to The Budd Company, Philadelphia, Pa.

Filed June 22, 1970, Ser. No. 48,240
Int. Cl. C23b *7/00*, *5/46*
U.S. Cl. 204—16 **4 Claims**



Dissimilar metal parts such as aluminum and stainless steel are machined to prepare a connecting joint between the parts. Preliminary adherent coatings are individually applied to the dissimilar metal parts in the machined areas. The parts are then positioned together and subject to anodic and cathodic treatments. Metal is then electrodeposited to fill in machined portions of the joint, to provide a mechanical structure capable of transmitting stress from one part to the other.

3,671,407

METHOD FOR PREVENTING HIGH-TEMPERATURE BLISTERING OF COPPER COATINGS ELECTRODEPOSITED ON COPPER SUBSTRATES

Colin B. Hamilton, Monroeville, and Edward J. Oles, Jr., Pittsburgh, both of Pa., assignors to United States Steel Corporation

Filed Sept. 11, 1970, Ser. No. 71,559
Int. Cl. C23b *3/02*
U.S. Cl. 204—32 R **8 Claims**

A method for preparing the surface of copper substrates by anodically dissolving the surface, for a time and depth sufficient to substantially decrease higher local oxygen content of the surface and thereby improve the adhesion of electrodeposited copper coatings. More specifically, the surface pretreatment provides a base for an electrodeposited copper coating with enhanced resistance to blistering and peeling at temperatures in excess of 700° F.

3,671,408

RHODIUM-PLATINUM PLATING BATH AND PROCESS

Albert Michael Martini, Florham Park, N.J., assignor to Sel-Rex Corporation, Nutley, N.J.

Filed May 25, 1971, Ser. No. 146,808
Int. Cl. C23b *5/32*
U.S. Cl. 204—43 **13 Claims**

An electrolyte and process for electrodepositing a low stress and mirror bright rhodium-platinum alloy. The electrolyte comprises an aqueous solution of rhodium sulfate, platinum as P salt and sulfamic acid.

3,671,409

ELECTRODEPOSITION OF NICKEL

Ernest Charles Henry Barrett, Thornton Heath, England, assignor to London & Scandinavian Metallurgical Co., Limited, London, England

Filed May 4, 1970, Ser. No. 34,638
Claims priority, application Great Britain, May 7, 1969, 23,285/69
Int. Cl. C23b *5/08*
U.S. Cl. 204—49 **9 Claims**

Known nickel plating baths can have large amounts of chloride incorporated in them. An improved nickel plating bath is described which has water-soluble bromide in it, preferably many times the weight of nickel present. The bath can include other electrodepositable metals besides nickel, so that the electrodeposition of hard nickel alloys can also be accomplished. The main result of the high bromide formulations proposed is to give deposits of nickel or its alloys which are notably free from stress. Many examples of nickel plating baths are given.

3,671,410

METHOD FOR MAKING METAL OXIDE MEMBRANES

Henry M. Stahr, Ames, Iowa, assignor to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 16, 1970, Ser. No. 11,785
Int. Cl. C23b *9/00*
U.S. Cl. 204—56 **9 Claims**

Metal oxide membranes are produced by anodization of selected metals capable of forming coherent but porous oxide films. The remaining unoxidized metal is removed by reaction with bromine or ammonium bromide leaving a flexible, mechanically strong metal oxide film of about 300 to 20,000 A. thickness.

3,671,411

TREATMENT OF CARBON OR GRAPHITE FIBERS AND YARNS FOR USE IN FIBER REINFORCED COMPOSITES

James D. Ray, Springfield; Samuel Steingiser, and Robert A. Cass, both of Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

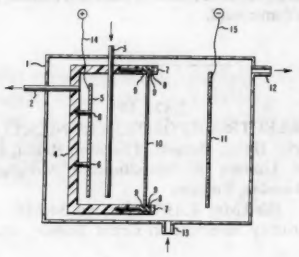
Filed March 3, 1970, Ser. No. 16,251
Int. Cl. B01k *1/00*
U.S. Cl. 204—130 **5 Claims**

Carbon fiber or yarn as used in fiber reinforced composites is electrolytically treated to improve the surface characteristics and thereby to improve its bonding or adhesion to the matrix material. By this improved bonding, shear strengths of resultant fiber resin or plastic composites have been more than doubled. The electrolytic treatment is conducted by using the fiber or yarn as the anode and using en electrolyte such as an aqueous caustic solution.

3,671,412
PROCESS FOR THE REMOVAL OF IONIC CONTAMINANTS FROM AN ELECTROCOATING BATH

James E. Lohr, Wallingford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed April 28, 1970, Ser. No. 32,663
Int. Cl. B01k *5/02*; C23b *13/00*; B01b *13/02*
U.S. Cl. 204—181 5 Claims

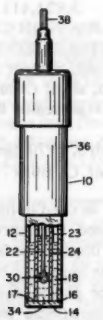


An electrolysis cell for the removal of ionic contaminants from an electrocoating bath and the utilization of this electrolysis cell in an electrocoating process are the subjects of this invention; the electrolysis cell comprises an anode assembly of a frame having attached thereto a metal anode and an anion permeable membrane that is held by the frame in close relationship with the anode and forms a compartment between the membrane and the anode; a cathode is positioned in a close relationship to the anode assembly; the electrocoating bath is brought into contact with the membrane and anionic impurities that are present in the bath migrate toward the anode and are removed from the compartment in the anode assembly; the membrane is impermeable to the film-forming polymeric materials and pigments utilized in the electrocoating bath and is selectively permeable to the water-soluble anionic impurities in the bath; the electrolysis cell can be positioned directly in the electrocoating bath utilized in the electrocoating process or may be positioned outside of the bath and have the bath passed through the electrolysis cell and recycles into the bath. It is also possible to remove cationic contaminants from the bath by using a cation permeable membrane positioned in a cathode assembly similar to the above anode assembly in the electrolysis cell.

3,671,413
NITRATE ION SENSITIVE ELECTRODE

Warren M. Wise, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 18, 1971, Ser. No. 107,138
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 L 4 Claims



An electrode for measuring the concentration of nitrate ions in an aqueous solution wherein the sensing portion is an organic phase containing a high molecular weight quaternary ammonium salt dissolved in a high molecular weight nitrophenyl-type solvent.

3,671,414
HYDROGEN ION-SELECTIVE SENSOR

Willard T. Grubb, Schenectady, N.Y., assignor to General Electric Company

Filed March 10, 1971, Ser. No. 122,854
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 R 7 Claims

A hydrogen ion-selective sensor comprises an elongated, flexible tube having opposite open ends and being electrically insulating, a silver-silver halide reference electrode positioned at least partially within the tube, an electrical lead in electrical contact with the reference electrode, a gelled electrolyte solution containing at least one halide salt solution filling the tube and in contact with the silver halide coated portion of the reference electrode and with the opposite end of the tube, a metal tube with an exterior surface of palladium surrounding at least a portion of the first tube, an electrical lead in contact with the metal tube, palladium oxide adhering tightly to at least a portion of the exterior surface of palladium on the metal tube, and electrical insulation surrounding the remaining palladium surface on the metal tube and its associated electrical lead.

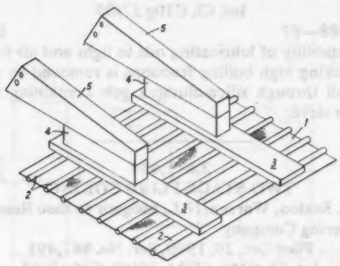
3,671,415
CONTINUOUS LEAD-IN CORE FOR AN ELECTRODE ASSEMBLY

John Howliston King, and Frank Smith, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 21, 1970, Ser. No. 66,034
Claims priority, application Great Britain, Sept. 2, 1969, 43,329/69
Int. Cl. B01k *3/04*; C23b *5/68*, *5/74*
U.S. Cl. 204—284 7 Claims

An electrode assembly is provided for an electrolytic cell which comprises a substantially horizontally extending foraminate titanium structure carrying on at least a part of its surface a coating comprising an operative anode material, an array of parallel spaced rods approximately covering the area of said foraminate structure, each rod having a titanium casing which is rigidly and conductively connected along its length to the upper surface of said foraminate structure and is also attached to the titanium casing of at least one rectangular bar which passes transversely over said rods by welds which enclose in fluid-tight manner intercommunicating openings through the juxtaposed areas of the casings of said rod and said bar, the casing of each said rectangular bar having an

opening in its upper face, and attached in fluid-tight manner to said upper face to enclose said opening an upstanding wall of titanium sheet, the space within said upstanding wall and the titanium casings of said bar and said rods being substantially



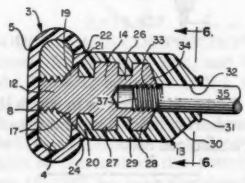
filled by a continuous core of aluminum or an aluminum alloy, said core being bonded to the surrounding titanium surfaces by an inter diffusion layer of an alloy formed between the core metal and the surrounding titanium metal.

3,671,416

BULGED SPHINCTERAL SEALS FOR ELECTROPLATING RACKS

Ralph E. Belke, Oak Park, Ill., assignor to Belke Manufacturing Company, Chicago, Ill.

Filed Feb. 8, 1971, Ser. No. 113,323
Int. Cl. C23g *5/70*
U.S. Cl. 204—297 R **6 Claims**



A sealed electrically conductive connection for a hanger to an insulated spine of an electroplating rack. The rack is coated with a plastisol material which prior to curing in an electroplating bath is flexible and which hardens in use. The connection comprises a plastic connector which has a conical end portion which extends into an annular aperture in the plastisol material and stretches it to obtain a sphincteral embrace thereby and bulge the material to obtain a thick section which resists hardening throughout, and thus maintains its elasticity and seal. A counter-sunk portion in the spine mates with a metalic connecting stud to obtain a good contact and the connector has a bore to tightly admit a hook shank.

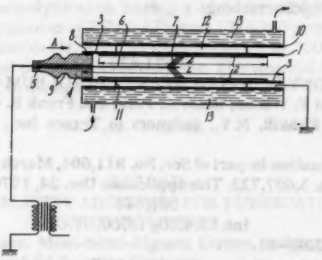
3,671,417

DIELECTRICS FOR OZONE-GENERATING APPARATUSES

Robert Louboutin, La Celle St. Cloud, France, assignor to Degremont, Societe Generale D'Epuration et D'Assainissement, Rueil-Malmaison, France

Filed June 3, 1970, Ser. No. 42,915
Int. Cl. C01b *13/12*
U.S. Cl. 204—320 **6 Claims**

An assembly for an ozone-generating apparatus consisting of a cylindrical tube of constant thickness which is provided with an internal metal coating and which is characterized in that said tube, which is made of glass or of any other suitable material able to be used in an ozone-generating apparatus, is essentially open at both ends but fitted at one end (or both ends in some cases) with a removable plug which is formed of ozone-resistant insulating material and provided with an axial passageway. A metal rod is adapted to pass through the passageway and serves to apply voltage to the metal coating which is formed on the internal face of the dielectric tube, the



length of said coating being slightly smaller than the length of said tube. The rod is of smaller diameter than the passageway in order to admit cooling air into the dielectric tube. The plug may either be inserted into the corresponding extremity of the tube of insulating material or placed over said extremity.

3,671,418

COAL LIQUEFACTION PROCESS USING ASH AS A CATALYST

John G. Gatsis, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 18, 1970, Ser. No. 99,676
Int. Cl. C10g *1/06, 1/08*
U.S. Cl. 208—10 **7 Claims**

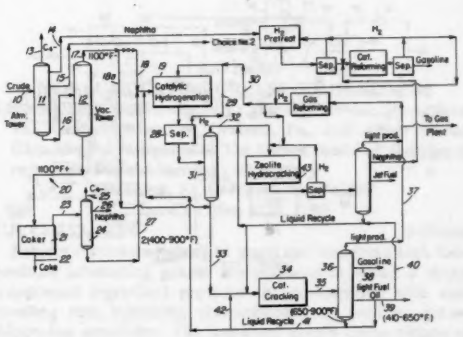
A method for the liquefaction of coal using a solvent extraction process in which finely-divided coal, a solvent, and a catalyst-acting ash derived from coal are admixed and subjected to solvent extraction conditions. The ash utilized in the solvent extraction process is a substantially carbon-free residue resulting from the decarbonization of coal.

3,671,419

UPGRADING OF CRUDE OIL BY COMBINATION PROCESSING

Henry R. Ireland, West Deptford Township, Gloucester County, and Paul W. Snyder, Jr., Pitman, both of N.J., assignors to Mobil Oil Corporation

Filed Feb. 27, 1970, Ser. No. 14,908
Int. Cl. C10g *37/00*
U.S. Cl. 208—57 **7 Claims**



Efficient utilization of hydrogen and catalyst compositions is achieved in a petroleum refinery operation by a specific

combination of unit operations which tend to optimization of premium products. A significant feature of this combination is catalytic hydrogenation of a fraction boiling above the gasoline range up to 1,100° F. followed by cutting or separating the hydrogenated product to form a high boiling fraction boiling above about 700° F. as charge to a crystalline aluminosilicate catalytic cracking operation with the low boiling fraction thereof boiling below about 700° F. being charge to catalytic hydrocracking.

3,671,420

CONVERSION OF HEAVY PETROLEUM OILS

Raymond F. Wilson; Reese A. Peck, and Frank E. Guptill, Jr., all of Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 811,604, March 28, 1969, Pat. No. 3,607,723. This application Dec. 24, 1970, Ser. No. 101,444

Int. Cl. C10g *13/00, 37/02*

U.S. Cl. 208—61 9 Claims

Residue-containing petroleum oils are converted into lighter products by a combination of catalytic hydrocracking and catalytic cracking.

3,671,421

PROCESS FOR INCREASING THE YIELD OF LOWER BOILING HYDROCARBONS

Reese A. Peck, and Raymond F. Wilson, both of Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 787,560, Dec. 27, 1968, abandoned. This application Nov. 13, 1970, Ser. No. 89,518

Int. Cl. C10g *13/12*

U.S. Cl. 208—68 12 Claims

A process for increasing the yield of lower boiling hydrocarbons from heavy hydrocarbon fractions by oxidizing a heavy hydrocarbon fraction using for example air followed by subjecting the oxidized heavy hydrocarbon fraction to both a pyrolysis step and hydrocracking step.

3,671,422

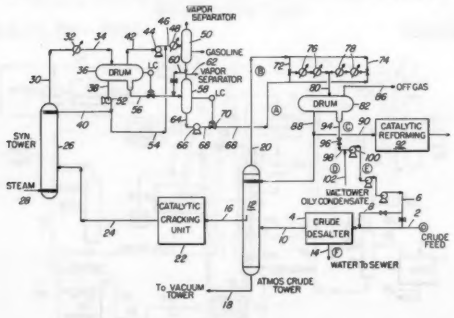
WATER POLLUTION ABATEMENT IN A PETROLEUM REFINERY

Terry R. Morrow, Tonawanda, N.Y., assignor to Mobil Oil Corporation

Filed Nov. 13, 1970, Ser. No. 89,207

Int. Cl. C07c *37/22*; C01g *37/10*

U.S. Cl. 208—79 4 Claims



The processing of refinery waters to recover phenolic constituents of catalytic cracking by adsorption with light process naphthas passed to catalytic reforming is discussed.

3,671,423

STABILIZING HYDROCRACKED LUBRICATING OILS

John M. MacDonald, and Ian D. Campbell, both of Sarnia, Ontario, Canada, assignors to Esso Research and Engineering Company

Filed March 16, 1970, Ser. No. 20,134

Int. Cl. C10g *37/00*

U.S. Cl. 208—97 16 Claims

The instability of lubricating oils to light and air formed by hydrocracking high boiling fractions is removed by percolating the oil through silica-alumina gels containing a Y-type molecular sieve.

3,671,424

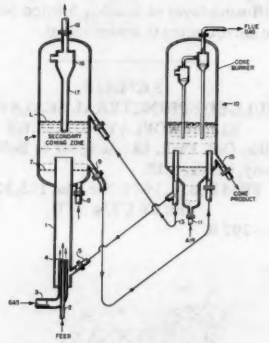
TWO-STAGE FLUID COKING

Arthur L. Saxton, Warren, N.J., assignor to Esso Research and Engineering Company

Filed Oct. 20, 1969, Ser. No. 867,491

Int. Cl. C10b *47/24, 55/10*; C10g *9/32*

U.S. Cl. 208—127 14 Claims



A two-stage fluid coking process in which the first stage is a transfer line for short contact time and the second is either a transfer line or a fluidized bed.

3,671,425

HYDROTREATING PROCESS USING A CATALYST COMPRISING A FLUORINE-CONTAINING LAYERED CRYSTALLINE ALUMINOSILICATE

Joseph Jaffe, Berkeley, and James R. Kittrell, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 754,491, Aug. 21, 1968. This application Dec. 18, 1969, Ser. No. 886,381

Int. Cl. C10g *23/02*

U.S. Cl. 208—216 1 Claim

A hydrodesulfurization process is carried out with a catalyst containing particles of (1) a fluorine-containing layered crystalline clay-type aluminosilicate and (2) a tetravalent metal phosphate in an alumina matrix, which also contains a hydrogenating component of group VI metals, or compounds thereof, and a hydrogenating component of group VIII metals, or compounds thereof.

3,671,426

CONTINUOUS FILTERING PROCESS

John C. Orcutt, and Forest O. Mixon, both of Chapel Hill, N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

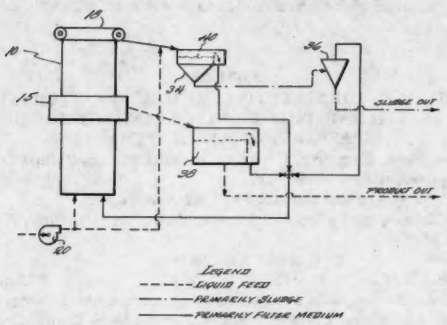
Filed Sept. 1, 1970, Ser. No. 68,611

Int. Cl. B01d *33/16*

U.S. Cl. 210—20 9 Claims

A continuous process for removing particulate and dissolved impurities from a liquid comprising the steps of inject-

ing a particulate filter medium into a liquid stream to form a slurry, conveying the slurry into the bottom portion of a separation vessel, accumulating the particulate filter material in the form of a porous plug, moving said plug into the upper portion of said separation vessel, pumping the liquid through



the lower portions of said plug, removing the liquid from the upper portion of the separation vessel, removing the particulate filter material from the upper end of the separation vessel above the point at which the liquid is discharged and subjecting the removed filter material to a cleansing or regeneration treatment for reuse in the process.

3,671,427

LIGNITE PRODUCTS AND COMPOSITIONS THEREOF

Robert S. Andrews, Jr., Houston, Tex., and William C. McDaniels, Hobbs, N. Mex., assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 539,312, April 1, 1966, Pat. No. 3,494,865. This application Jan. 15, 1970, Ser. No. 3,216. The portion of the term of this patent subsequent to Feb. 10, 1987, has been disclaimed.

Int. Cl. C10m *1/36*

U.S. Cl. 252—8.5 M **8 Claims**

Reaction products of humic acid with long-chain fatty acyl partial amides of a polyalkylene polyamine, such as the reaction product obtained using tall oil fatty acids and tetraethylene pentamine, the salt linkage being optionally, partially or largely converted to amide linkage by heat treatment. The humic acid optionally may be in part reacted with a long-chain alkyl ammonium cation. The novel products are useful in compounding oil base well-working fluids; as corrosion inhibitors; and for other uses.

3,671,428

LIGNIN DERIVATIVE

Chung Sur Youn Kim, Sacramento, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Division of Ser. No. 629,894, April 11, 1967, Pat. No. 3,538,071. This application Feb. 20, 1970, Ser. No. 13,186. The portion of the term of this patent subsequent to Jan. 27, 1987, has been disclaimed.

Int. Cl. C10m *1/40, 1/32*

U.S. Cl. 252—8.5 M **14 Claims**

Lignin derivatives, particularly for use in oil base drilling muds, are obtained by reacting an oxidized lignin with an amine to form a salt and heating the resulting salt to elevated temperatures until a substantial portion of the product is converted to a nitrogen containing product wherein the nitrogen is stable in an aqueous alkaline medium at room temperature.

3,671,429

GREASE-LIKE SILICONE COMPOUND

John H. Wright, Elnora, N.Y., assignor to General Electric Company

Filed Sept. 25, 1969, Ser. No. 861,180

Int. Cl. C10m *7/50, 7/28*

U.S. Cl. 252—25 **5 Claims**

Grease-like compositions consisting of (1) 100 parts of a liquid organopolysiloxane having a viscosity of from 50 to 200,000 centistokes at 25° C., (2) from 17 to 300 parts of finely divided zinc oxide, and (3) from about 17 to 300 parts of finely divided polytetrafluoroethylene. The material is useful, particularly, in electrical switch gear.

3,671,430

HIGH ALKALINITY ADDITIVES FOR LUBRICATING OIL COMPOSITIONS

Jean Corringer, Mont-Saint-Aignan, France, assignor to Esso Research and Engineering Company

Continuation-in-part of Ser. No. 44,632, June 8, 1970, abandoned, which is a continuation of Ser. No. 625,307, March 23, 1967, abandoned. This application Jan. 19, 1971, Ser. No. 107,846

Claims priority, application France, Jan. 21, 1970, 7002168

Int. Cl. C10m *1/40, 1/48*

U.S. Cl. 252—32.7 E **18 Claims**

An alkaline earth metal sulfonate of high alkalinity is prepared by reacting an alkaline earth metal base, e.g. calcium hydroxide, with carbon dioxide in the presence of the metal sulfonate and an alkaline earth metal phenate, there also being present a polar solvent such as benzyl alcohol or tetrahydrofurfuryl alcohol, as well as free phenol in an amount over and above the stoichiometric quantity necessary to form metal phenate by reaction with the metal base. At the end of the reaction the solvent and free phenol are removed from the product by distillation. Preformed metal phenate can be used at the beginning of the reaction or the metal phenate can be formed in situ, starting with free phenol. Also, in place of metal sulfonate, free sulfonic acid can be used initially, with sufficient metal base to convert it to metal sulfonate. The attainment of total base numbers of 400 or more is possible by use of a second dispersant along with the metal sulfonate. This second dispersant, which is used with the sulfonate in the proportion of 0.1 to 1 part per part of sulfonate, can be a thioacid of phosphorus, or metal salt thereof, obtained by reaction of a sulfide of phosphorus on a hydrocarbon; an alkyl phenol or alkyl phenol sulfide, or metal salt thereof; or a monocarboxylic or polycarboxylic acid or anhydride, or metal salt thereof, characterized by a long chain hydrocarbon group of from about 20 to 200 carbon atoms, as for example, a polyisobutenyl succinic acid.

3,671,431

NEW LUBRICATING GREASE COMPOSITIONS

Leon Stallings, Sicklerville, N.J.; Martin J. Devine, Havertown, Pa.; Gerhard Maerker, Oreland, Pa., and Abner Eisner, Glenside, Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 22, 1970, Ser. No. 74,488

Int. Cl. C10m *5/20, 7/30*

U.S. Cl. 252—33.6 **5 Claims**

Subject disclosure relates to novel and improved high temperature lubricating grease compositions in which a single component ingredient provides the composition with outstanding rust inhibiting characteristics as well as grease thickening properties. The improved grease compositions of the invention consist of specified diester, hydrocarbon and silicone fluids thickened and rust inhibited by specific quantities of the additive lithium cis-9-10-epimino octadecanoate.

3,671,432

PREPARATION OF SUPPORTED TRANSITION METAL OXIDE POLYMERIZATION CATALYSTS

Edwin F. Peters, Lansing, and Omar O. Juveland, South Holland, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 637,075, May 9, 1969, abandoned. This application Oct. 23, 1969, Ser. No. 868,941

Int. Cl. B01j *11/32*

U.S. Cl. 252—467 **4 Claims**

Polymerization catalysts are prepared by adsorbing water upon an inert support and extending a water-dispersible or soluble transition metal compound upon the support by mixing. The water is then removed and the transition metal compound converted to a highly oxidized state by calcination.

3,671,433

LUBRICANT COMPOSITIONS

Bruce C. Brenner, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 17, 1970, Ser. No. 99,255

Int. Cl. C10m *1/50*

U.S. Cl. 252—49.6 **7 Claims**

The lubrication characteristics of alkylmethylpolysiloxanes in which the alkyl radical contains from six–18 carbon atoms are improved by the addition of from about 0.1 to 3 weight percent dodecenyl succinic acid anhydride.

3,671,434

QUINONE PHOSPHATES AS LUBRICANT ADDITIVES

Stephen J. Metro, Scotch Plains, and Harold Shaub, New Providence, both of N.J., assignors to Esso Research and Engineering Company

Filed Aug. 21, 1970, Ser. No. 66,077

Int. Cl. C10m *1/46*

U.S. Cl. 252—49.8 **11 Claims**

Quinone phosphates, including pentoxyphosphoranes, have been found to be effective oxidation and corrosion inhibitors in lubricating oils, especially synthetic ester oils.

ERRATUM

For Class 252—62 see:
Patent No. 3,671,646

3,671,435

COBALT DOPED GAMMA FERRIC OXIDE

Paul Y. Hwang, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 822,709, May 5, 1969, abandoned. This application July 16, 1971, Ser. No. 163,424

Int. Cl. C01g *49/06*; H01f *1/00*

U.S. Cl. 252—62.56 **4 Claims**

Acicular, cobalt doped gamma ferric oxide particles suitable for magnetic recording are produced by making an aqueous paste or slurry of a cobalt salt which will decompose below 600° C. and acicular alpha FeOOH or alpha Fe_2O_3. The cobalt salt is decomposed to the metal or oxide form by heating the mixture. Various cobalt and iron compounds can be used as the starting materials.

3,671,436

METHOD OF MANUFACTURING A SINTERED OXIDIC FERROMAGNETIC BODY

Hans Peter Peloschek, and David Jacob Perduijn, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed March 11, 1970, Ser. No. 18,676

Claims priority, application Netherlands, March 20, 1969, 6904352

Int. Cl. C04b *35/30*

U.S. Cl. 252—62.58 **3 Claims**

Stringent requirements as regards the resistance to detrition are imposed upon the sintered oxidic ferromagnetic material of which particularly pole shoes of magnetic heads are manufactured, when said heads are used at very high tape speeds. No crumbling away of crystals or groups of crystals must take place. Sintered oxidic ferromagnetic material which consists of large interlocking crystals (diameter more than 50 microns) has a high resistance to detrition. A method of obtaining such a crystal structure comprises the addition of from 0.01 to 0.1 percent by weight of an alkaline earth metaborate to the starting mixture of the metal oxides to be sintered, e.g. NiO, ZnO and Fe_2O_3.

3,671,437

ETCHANT FOR SELECTIVELY ETCHING PATTERNS IN THIN SILICON DIOXIDE LAYERS AND METHOD OF PREPARING SUCH AN ETCHANT

Uwe Pless, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 16, 1970, Ser. No. 81,523

Claims priority, application Germany, Oct. 15, 1969, P 19 51 968.7

Int. Cl. C23d *1/00*

U.S. Cl. 252—79.3 **2 Claims**

This disclosure is directed to an aqueous etching composition for silicon dioxide based on ammonium fluoride and hydrofluoric acid to which an arsenic or thallium salt has been added and to a method of etching layers of silicon dioxide by means of said etching composition.

3,671,438

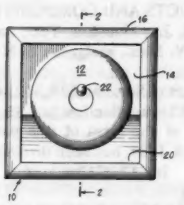
SOAP AND CONTAINER THEREFOR

Paolo Cilia, 638 Ovington Ave., Brooklyn, N.Y.

Filed Feb. 18, 1970, Ser. No. 12,198

Int. Cl. C11d *17/00*

U.S. Cl. 252—90 **3 Claims**



A container for holding a bar of soap includes a vertical wall portion, a horizontal flange portion extending from the wall portion to form an enclosure about the bar of soap and a peg secured to the central region of the wall portion. The bar of soap contains a central aperture extending therethrough to engage the peg for supporting the bar of soap thereon. A relatively non-soluble insert is provided within the bar about the aperture to better maintain the aperture at substantially its initial diameter despite the gradual diminishing of the size of the bar of soap during use.

3,671,439

OXYGEN BLEACH-ACTIVATOR SYSTEMS STABILIZED WITH PUFFED BORAX

Garland G. Corey, Milltown, and Bernard Weinstein, Plainfield, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed July 22, 1969, Ser. No. 843,829. The portion of the term of this patent subsequent to May 9, 1989, has been disclaimed.

Int. Cl. C11d *7/54, 7/18*

U.S. Cl. 252—99 **9 Claims**

Oxygen releasing bleaches such as perborates are combined with activators and puffed borax to provide compositions unusually stable upon storage under adverse conditions of high temperature and humidity to which they are normally subjected.

3,671,440
PROCESS OF CLEANING
Philip M. Sabatelli; Edwin R. Loder, both of Cincinnati, Ohio; Charles A. Brungs, and Carmen R. Sarge, both of Ft. Thomas, Ky., assignors to Chemed Corporation, Cincinnati, Ohio
Filed Jan. 16, 1970, Ser. No. 3,520
Int. Cl. C11d 7/54
U.S. Cl. 252—103 6 Claims

Concentrates of liquid chlorine containing machine dishwashing compositions are disclosed which include alkali metal hydroxide, a tetra-alkali metal pyrophosphate, a water-soluble polymer, an alkali metal hypochlorite and an aqueous carrier liquid or vehicle. These concentrates have improved long lasting hard water tolerance. Cooking and eating utensils may be cleaned by dilute solutions of the present machine dishwashing compositions in water having hardness as high as 20 grains per gallon or more with less spotting and greater clarity.

3,671,441
DRY CLEANING DETERGENT
Lawrence Dasch, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio
Filed Nov. 4, 1968, Ser. No. 773,354
Int. Cl. C11d 1/18; C09d 9/00
U.S. Cl. 252—153 1 Claim

Dry-cleaning compositions containing a combination of an amine oxide and a phosphate ester of a nonionic surfactant are shown to give optimum results with respect to the removal of all types of soils and particularly the removal of water-soluble soils from the articles being dry-cleaned. Other components may optionally be added to obtain certain specific results.

3,671,442
AZEOTROPIC COMPOSITION
J. Allan Schofield, Irvington, and Roger A. Delano, Dobbs Ferry, both of N.Y., assignors to Union Carbide Corporation
Division of Ser. No. 677,715, Oct. 24, 1967, Pat. No. 3,554,918. This application June 2, 1970, Ser. No. 54,081
Int. Cl. C11d 7/50; C23g 5/02
U.S. Cl. 252—171 3 Claims

It is not intended that the following abstract of the disclosure be construed as limiting the invention in any manner.

The disclosure relates to binary azeotropic mixtures of tetrachlorodifluoroethane and methanol. It has also been discovered that n-butanol or isobutanol or sec-butanol will form azeotropes with these halogenated solvents.

The disclosure also relates to ternary azeotropes of tetrachlorodifluoroethane and trichloroethylene with methanol. It has also been discovered that ethanol or isopropanol will also form ternary azeotropes with these two halogenated solvents.

In a further embodiment ternary azeotropes are disclosed comprising tetrachlorodifluoroethane, trichloroethane and methanol. It has also been discovered that ethanol and isopropanol will also form ternary azeotropes with these two halogenated solvents.

3,671,443
AZEOTROPIC COMPOSITION
J. Allan Schofield, Irvington, and Roger A. Delano, Dobbs Ferry, both of N.Y., assignors to Union Carbide Corporation
Division of Ser. No. 677,715, Oct. 24, 1967, Pat. No. 3,554,918. This application June 2, 1970, Ser. No. 54,082
Int. Cl. C11d 7/50; C23g 5/02
U.S. Cl. 252—171 3 Claims

It is not intended that the following abstract of the disclosure be construed as limiting the invention in any manner.

The disclosure relates to binary azeotropic mixtures of tetrachlorodifluoroethane and methanol. It has also been discovered that n-butanol or isobutanol or sec-butanol will form azeotropes with these halogenated solvents.

The disclosure also relates to ternary azeotropes of tetrachlorodifluoroethane and trichloroethylene with methanol. It has also been discovered that ethanol or isopropanol will also form ternary azeotropes with these two halogenated solvents.

In a further embodiment ternary azeotropes are disclosed comprising tetrachlorodifluoroethane, trichloroethane and methanol. It has also been discovered that ethanol and isopropanol will also form ternary azeotropes with these two halogenated solvents.

3,671,444
AZEOTROPIC COMPOSITION
J. Allan Schofield, Irvington, and Roger A. Delano, Dobbs Ferry, both of N.Y., assignors to Union Carbide Corporation
Division of Ser. No. 677,715, Oct. 24, 1967, Pat. No. 3,554,918. This application June 2, 1970, Ser. No. 54,084
Int. Cl. C11d 7/50; C23g 5/02
U.S. Cl. 252—171 3 Claims

It is not intended that the following abstract of the disclosure be construed as limiting the invention in any manner.

The disclosure relates to binary azeotropic mixtures of tetrachlorodifluoroethane and methanol. It has also been discovered that n-butanol or isobutanol or sec-butanol will form azeotropes with these halogenated solvents.

The disclosure also relates to ternary azeotropes of tetrachlorodifluoroethane and trichloroethylene with methanol. It has also been discovered that ethanol or isopropanol will also form ternary azeotropes with these two halogenated solvents.

In a further embodiment ternary azeotropes are disclosed comprising tetrachlorodifluoroethane, trichloroethane and methanol. It has also been discovered that ethanol and isopropanol will also form ternary azeotropes with these two halogenated solvents.

3,671,445
AZEOTROPIC COMPOSITION
J. Allan Schofield, Irvington, and Roger A. Delano, Dobbs Ferry, both of N.Y., assignors to Union Carbide Corporation
Division of Ser. No. 677,715, Oct. 24, 1967, Pat. No. 3,554,918. This application June 2, 1970, Ser. No. 54,086
Int. Cl. C11d 7/50; C23g 5/02
U.S. Cl. 252—171 3 Claims

It is not intended that the following abstract of the disclosure be construed as limiting the invention in any manner.

The disclosure relates to binary azeotropic mixtures of tetrachlorodifluoroethane and methanol. It has also been discovered that n-butanol or isobutanol or sec-butanol will form azeotropes with these halogenated solvents.

The disclosure also relates to ternary azeotropes of tetrachlorodifluoroethane and trichloroethylene with methanol. It has also been discovered that ethanol or isopropanol will also form ternary azeotropes with these two halogenated solvents.

In a further embodiment ternary azeotropes are disclosed comprising tetrachlorodifluoroethane, trichloroethane and methanol. It has also been discovered that ethanol and isopropanol will also form ternary azeotropes with these two halogenated solvents.

3,671,446
AZEOTROPIC COMPOSITION
J. Allan Schofield, Irvington, and Roger A. Delano, Dobbs Ferry, both of N.Y., assignors to Union Carbide Corporation
Division of Ser. No. 677,715, Oct. 24, 1967, Pat. No. 3,554,918. This application June 2, 1970, Ser. No. 54,085
Int. Cl. C11d 7/50; C23g 5/02
U.S. Cl. 252—171 3 Claims

It is not intended that the following abstract of the disclosure be construed as limiting the invention in any manner.

The disclosure relates to binary azeotropic mixtures of

tetrachlorodifluoroethane and methanol. It has also been discovered that n-butanol or isobutanol or sec-butanol will form azeotropes with these halogenated solvents.

The disclosure also relates to ternary azeotropes of tetrachlorodifluoroethane and trichloroethylene with methanol. It has also been discovered that ethanol or isopropanol will also form ternary azeotropes with these two halogenated solvents.

In a further embodiment ternary azeotropes are disclosed comprising tetrachlorodifluoroethane, trichloroethane and methanol. It has also been discovered that ethanol and isopropanol will also form ternary azeotropes with these two halogenated solvents.

3,671,447

METHODS OF SCALE INHIBITION USING SUBSTOICHIOMETRIC AMOUNTS OF AMINO ALCHOLS

Xavier Kowalski, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed July 27, 1970, Ser. No. 58,705

Int. Cl. C02b *5/06*

U.S. Cl. 252—180 **10 Claims**

The precipitation of scale-forming materials in an aqueous system is inhibited by adding substoichiometric amounts of an amino alcohol such as triethanolamine to said system.

3,671,448

METHODS OF SCALE INHIBITION USING SUBSTOICHIOMETRIC AMOUNTS OF AMINO ALCOHOL AND PHOSPHONIC ACIDS

Xavier Kowalski, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 10, 1970, Ser. No. 71,245

Int. Cl. C02b *5/06*

U.S. Cl. 252—18 D **10 Claims**

The precipitation of scale-forming materials in an aqueous system is inhibited by adding substoichiometric amounts of a precipitation inhibitor which consists of a mixture of an amino alcohol such as triethanolamine and certain phosphonic acids, such as amino tri(methylene phosphonic acid), to said system.

3,671,449

CEPHALOSPORIN COMPOSITIONS

Billy G. Jackson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 754,992, Aug. 23, 1968, abandoned. This application Aug. 19, 1970, Ser. No. 65,237

Int. Cl. C07d *99/24*

U.S. Cl. 252—182 **5 Claims**

Silylated cephalosporin compositions containing (a) silyated cephalosporin nucleus compound, (b) a silylamide, and (c) an anhydrous solvent for components (a) and (b), which solvent does not contain Zerwitinoff hydrogen.

3,671,450

CHEMILUMINESCENT COMPOSITIONS

Michael McKay Rauhut, Norwalk, Conn., and Andrew Milo Semsel, Ridgefield, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 577,795, Sept. 7, 1966, abandoned. This application Sept. 22, 1969, Ser. No. 860,092

Int. Cl. C09k *3/00*

U.S. Cl. 252—186 **13 Claims**

A novel composition and the process of producing the composition, whereby the composition is in the form of a gel having chemiluminescent properties. More particularly, the invention relates to the direct production of light from chemical energy employing any chemiluminescent compositions in the presence of a gelling agent. By "light" as referred to herein is meant electromagnetic radiation at wavelengths falling between about 350 mμ and 1,000 mμ.

3,671,451

FLUORESCENT COMPOSITIONS

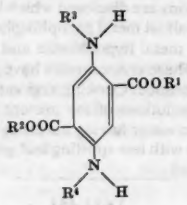
Boydston Lewis Butterfield, East Amwell Township, Hunterdon County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed March 27, 1968, Ser. No. 716,318

Int. Cl. C09k *1/00*; F21k *2/00*

U.S. Cl. 252—301.2 **9 Claims**

Compositions useful for imparting fluorescent properties to surfaces comprising at least one compound of the formula:



wherein R^1 and R^2 represent individually alkyl of 1–18 carbons; R^3 and R^4 each represent a monocyclic or bicyclic aryl radical.

3,671,452

GERMANIUM AND SILICON SUBSTITUTED MANGANESE ACTIVATED MAGNESIUM GALLATE PHOSPHOR

Taiichi Inoue, and Toshimasa Ueda, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 4, 1970, Ser. No. 34,322

Claims priority, application Japan, May 8, 1969, 44/35067; May 10, 1969, 44/35643

Int. Cl. C09k *1/04, 1/54*

U.S. Cl. 252—301.4 F **3 Claims**

A method for manufacturing a phosphor material represented by the following general formula:

$$yMgO_2 \cdot (1-x)Ga_2O_3 \cdot xMO_2 \cdot pMnO$$

where:

MO_2 = an oxide selected from the group consisting of GeO_2 and SiO_2

$0 < X \leq 0.3$

$0.70 \leq y \leq 1.05$

$0.001 \leq p \leq 0.05$

which comprises subjecting a mixture of oxides having a composition expressed by the general formula to a primary firing at a temperature of from 1,100° to 1,475° C. in an oxidizing atmosphere, grinding and mixing the fired mass, and subjecting the resultant mixture to a secondary firing at a temperature of from 1,000° to 1,250° C. in a reducing atmosphere.

3,671,453

PROCESS FOR PREPARING MULTI-COMPONENT NUCLEAR FUELS

Leonard V. Triggiani, Rockville, and Moises G. Sanchez, Severna Park, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 670,394, Sept. 25, 1967, Pat. No. 3,514,412. This application Sept. 24, 1969, Ser. No. 860,814

Int. Cl. C09k *3/00*

U.S. Cl. 252—301.1 S **10 Claims**

A process for preparing particles, powders, spheres, and other shapes of uranium carbide or uranium nitride and/or thorium carbide or thorium nitride containing significant amounts of a second fissionable component. The particles are prepared by impregnating a matrix with a sol or other suitable dispersion of the fissionable component.

3,671,454

SILICON AND/OR GERMANIUM DIOXIDE SUBSTITUTED MANGANESE ACTIVATED MAGNESIUM ALUMINATE GALLATE PHOSPHOR

Taiichi Inoue, and Toshimasa Ueda, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 5, 1970, Ser. No. 34,774

Claims priority, application Japan, May 9, 1969, 44/35220; May 16, 1969, 44/37346

Int. Cl. C09k *1/04, 1/54, 1/18*

U.S. Cl. 252—301.4 F 7 Claims

A phosphor material emitting a blue-green light which consists of a composition represented by the following general formula: $xMgO \cdot (1-y-z)Ga_2O_3 \cdot yAl_2O_3 \cdot zMO_2 \cdot pMnO$

where: MO_2 = one kind of oxides selected from the group consisting of GeO_2 and SiO_2

$$0.70 \leqq x \leqq 1.05$$
$$0.025 \leqq y \leqq 0.4$$
$$0 < z \leqq 0.3$$
$$0.001 \leqq p \leqq 0.05.$$

3,671,455

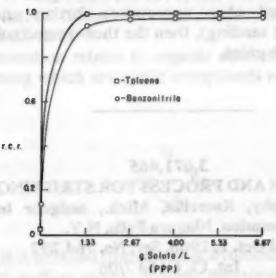
NITRILES AS SCINTILLATION SOLVENTS AND SOLUTES

Jose P. A. Castrillon, Rio Piedras, P.R., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed May 6, 1971, Ser. No. 140,926

Int. Cl. C09h *1/02*

U.S. Cl. 252—301.2 SC 9 Claims



Benzonitrile is shown to be an efficient scintillation solvent. Although somewhat inferior to toluene, it can surpass the performance of this standard solvent if quenchers are present. Furthermore, its high dielectric constant, dipole moment and complexing ability make it suitable for the counting of polar and metallic compounds. It has the interesting property of showing an appreciable light yield in the pure state, thus allowing the counting of α-emitters with no fluors added. Acetonitrile, on the other hand, is a very poor scintillation solvent, although it improves considerably on addition of naphthalene. Also, in a 40 percent mixture with benzonitrile, the efficiency is good enough for most purposes. It has been determined that other aromatic nitriles are also efficient scintillation solvents: p-tolunitrile, 2,3- and 2,4-dimethylbenzonitrile and phenylacetonitrile, for example. Certain aromatic nitriles are shown to be fairly satisfactory scintillation solutes.

3,671,456

SMOKE OR GAS PRODUCING COMPOSITION

Rolf Andersson, Tamnarragen 26, Johanneshov, Sweden

Filed March 31, 1970, Ser. No. 24,204

Int. Cl. C09k *3/30*

U.S. Cl. 252—305 7 Claims

A smoke or gas-producing compound usable even in spin stabilized grenades, consisting of a gas producing liquid ($TiCl_4$) absorbed in a powder with great inner porosity. The grain division lies between 0.125 – 6 mm and the powder is under graded.

3,671,457

METHOD OF MAKING STABLE, LOW VISCOSITY WAX-IN-WATER EMULSIONS

Warren K. Porter, Jr., Richland Township, Allegheny County, Pa., assignor to Gulf Research of Development Company, Pittsburgh, Pa.

Filed May 28, 1970, Ser. No. 41,590

Int. Cl. B01j *13/00*

U.S. Cl. 252—311.5 10 Claims

There is described a novel method for producing low viscosity water emulsions of high solids content from waxes using an alkylphenol ethoxylate emulsifying agent having at least 30 carbon atoms in the alkyl group. The emulsion is prepared by mixing the constituents at an elevated temperature, then cooling the emulsion below the melting point of the wax and finally reheating the emulsion to the melting point of the wax or higher to substantially lower the room temperature viscosity of the emulsion.

3,671,458

MIXTURES OF FATTY ETHERS OF POLYHYDRIC ALCOHOLS AND THEIR ANHYDRIDES AND PROCESS FOR PRODUCING SAID MIXTURES

Albert H. Sherman, New Castle, and John D. Zech, Wilmington, both of Del., assignors to Atlas Chemical Industries, Inc., Wilmington, Del.

Filed Sept. 17, 1969, Ser. No. 858,881

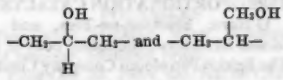
Int. Cl. B01f *17/32, 17/42*

U.S. Cl. 252—351 10 Claims

Ether compositions of fatty epoxides and polyhydric alcohols and a process for preparing said ethers are disclosed. These ether compositions are represented by the general formula:

$$[R - X - R_2 - O]_y - R_3 \qquad (1)$$

where R is an alkyl, alkenyl, alkaryl or alkenaryl radical; X is either S, O or a methylene radical, R_2 is selected from the group consisting of radicals of the following formulas:



y is a number from 1 to 4, and R_3 is a radical remaining after y hydroxyl groups are removed from an anhydrized polyhydric alochol; and mixtures of compounds within formula (1) with compounds represented by the general formula

$$[R-X-R_2-O]_y-R_1 \qquad (2)$$

wherein R, X, R_2 and y are as defined above and R_1 is a radical formed when y hydroxyl groups are removed from a polyhydric alcohol. The ether compositions are excellent surfactant compositions, being useful as antifoaming agents, emulsifiers and dispersants, and they are more resistant to acid and alkali solutions than organic ester type surfactants heretofore used.

3,671,459

HYDRATED EMULSIFIER

Max E. Norris, Parma, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Filed July 27, 1970, Ser. No. 58,658
Int. Cl. B01f *17/34*
U.S. Cl. 252—356 4 Claims

An improved hydrated emulsifier having from 30–65 percent lipoidal emulsifier component emulsified with from 70–35 percent water, the improvement comprising including at least about 30 percent by weight of the lipoidal emulsifier component of an edible alkoxylated partial fatty acid ester of glycerol.

3,671,460

DEFOAMING COMPOSITIONS AND METHODS OF PRODUCING SAME

Edwin M. Hofgesang, Montclair, N.J., assignor to Continental Oil Company, Ponca City, Okla.

Filed April 29, 1970, Ser. No. 33,056
Int. Cl. B01d *17/00*
U.S. Cl. 252—358 10 Claims

A defoaming composition is produced by reacting a liquid hydrophobic polysiloxane oil with a hydrophilic alpha alumina monohydrate so as to produce a hydrophobic alumina reaction product. The reaction product is then dispersed in a hydrocarbon medium to produce the defoaming composition. The defoaming composition contains from about 1 to 40 percent by weight of the reaction produce and from about 60 to 99 percent by weight hydrocarbon medium.

3,671,461

PROCESS FOR CONTROLLING FOAMS IN AQUEOUS SYSTEMS AND COMPOSITION THEREFOR

Edward Helmut Sheers, Flushing, and Frederick Ludwig Encke, Bronx, both of N.Y., assignors to Arizona Chemical Company, New York, N.Y.

Continuation-in-part of Ser. No. 637,228, May 9, 1967, abandoned. This application Dec. 18, 1969, Ser. No. 886,173
Int. Cl. B01d *17/00*
U.S. Cl. 252—358 5 Claims

Foam in aqueous media is controlled by compositions consisting essentially of (1) ethylene oxide adducts of rosin, and (2) fatty acids.

3,671,462

DISPROPORTIONATION CATALYST

Joan Irenee O'Hara, Stockton-on-Tees, and Christopher Patrick Cadman Bradshaw, Hampton, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Oct. 15, 1969, Ser. No. 866,755
Claims priority, application Great Britain, Nov. 6, 1968, 52,545/68
Int. Cl. C07c *3/62*
U.S. Cl. 252—429 A 5 Claims

A heterogeneous disproportionation catalyst is provided which consists essentially of (a) a salt of molybdenum or tungsten (b) tetrabutyl tin and (c) a solid support selected from the group consisting of alumina, silica, magnesia, sepiolite, boria, thoria, charcoal, pumice and molecular sieve and wherein the molar ratio of the tungsten or molybdenum salt to tetrabutyl tin is in the range of from about 5:1 to 0.01:1 and the support is present in an amount of from about 10 to 99.9 percent by weight expressed as a percentage by weight of the total weight of the salt, tetrabutyl tin and support.

3,671,463

PROCESS FOR EXTRUDED CATALYST AND CATALYST SUPPORTS

Joseph Dennis Colgan, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 27, 1970, Ser. No. 93,403
Int. Cl. B01j *11/44*, *11/36*
U.S. Cl. 252—448 10 Claims

A process for catalyst materials in extrudate form and at increased density by use of a mix mulling technique is disclosed wherein a high molecular weight, organic, water-soluble polymer is incorporated into the mix and results in increased density in the final formed catalyst at mulling times of 0–150 minutes.

3,671,464

SURFACER TREATING PROCESS FOR BLEMISHED ELECTROCOAT SUBSTRATES AND SURFACER COMPOSITION THEREFOR

Allan E. Gilchrist, Westlake, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Division of Ser. No. 674,639, Oct. 11, 1967, Pat. No. 3,578,277. This application March 5, 1970, Ser. No. 26,454
Int. Cl. H01b *1/06*; B44d *1/34*
U.S. Cl. 252—511 4 Claims

This patent application sets forth a process for surface treating an electrode substrate used in electrocoating, specifically, one which has surface imperfections or blemishes, and a surfacer composition therefor. The surfacer composition is a curable mixture comprising binder resin and sufficient electrically conductive filler mixed therewith for at most insignificantly changing, in cured thin final section on a blemished surface region of said substrate, the electrical resistance of said region relative to that of the untreated adjacent substrate to be coated. In accordance with the process surfacer composition is applied in thin layer to the blemished region of the substrate, cured (and when appropriate further and finally finished as by wet sanding), then the thus-treated substrate is electrocoated with paint.

3,671,465

COMPOSITION AND PROCESS FOR STRIPPING PAINT

Donald P. Murphy, Roseville, Mich., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 1, 1968, Ser. No. 764,292
Int. Cl. C11d *7/06*
U.S. Cl. 252—548 7 Claims

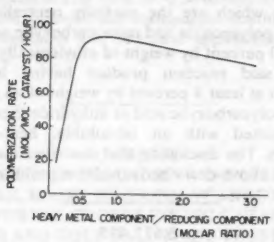
An aqueous alkaline stripping solution which contains an accelerator composition comprised of tripropylene glycol and an organic nitrogen compound of the formula:

wherein R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, alkanol and hydroxy ether groups, which latter groups contain from about two to 10 carbon atoms, at least one of R_1, R_2 and R_3 being other than hydrogen, the compound having a boiling point of at least about 100° C and a molecular weight which is not substantially in excess of about 500. The preferred alkaline stripping solution is an aqueous sodium hydroxide solution and the preferred components of the activator composition are tripropylene glycol and triethanolamine.

3,671,466
PROCESS FOR POLYMERIZING THREE-MEMBERED HETEROCYCLIC COMPOUNDS

Kazuo Shikata, Tokuyama; Suekiti Nakao, Tsuno-gun, and Katsutoshi Knomi, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Tokuyama-shi, Japan

Filed July 7, 1970, Ser. No. 52,887
Claims priority, application Japan, July 7, 1969, 44/53100
Int. Cl. C08g 23/14
U.S. Cl. 260—2 A 8 Claims



Process for polymerizing three-membered heterocyclic compounds such as propylene oxide, using a new binary catalyst, i.e., a combination catalyst of two metallic components: a heavy metal organic compound of either nickel or cobalt and an organic compound of zinc.

3,671,467
SELENIUM CONTAINING POLYMERS

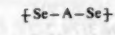
Wolfgang H. H. Gunther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 30, 1970, Ser. No. 59,495
Int. Cl. C08g 33/20; C07d 81/00; G03g 5/06
U.S. Cl. 260—2 M 16 Claims

This invention relates to organic diselenides and polyselenides among which are cyclic compounds represented by the formula:

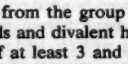
I

wherein R is selected from divalent hydrocarbylene radicals of five to 20 carbon atoms, divalent heterocyclic, alicyclic and aromatic radicals having from three to 50 carbon atoms, *n* is a positive integer and X is the radical — Se — R — Se — ; linear polymers having a repeating unit represented by the formula:



II

wherein A is selected from divalent alkylene radicals having from nine to 20 carbon atoms, divalent aromatic radicals from six to 50 carbon atoms and divalent heterocyclic radicals and polymers having a repeating unit represented by the formula:



III

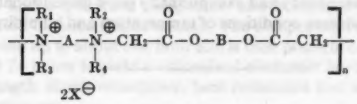
wherein B is selected from the group consisting of divalent hydrocarbylene radicals and divalent heterocyclic radicals, *a* is a positive integer of at least 3 and *b* is a positive integer greater than 1. This invention also relates to the use of these compounds in the production of electrophotographic plates.

3,671,468
POLYMERS AND PROCESS FOR PREPARING THE SAME

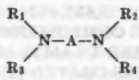
Minoru Tsuda, Kita-adachi-gun; Akio Yosida, and Takamitsu Yuki, both of Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 3, 1970, Ser. No. 69,231
Claims priority, application Japan, Sept. 4, 1969, 44/69709
Int. Cl. C08g 33/02
U.S. Cl. 260—2 R 19 Claims

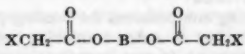
Novel polymers represented by the formula



where A and B are each selected from the group consisting of a straight and branched alkylene, a straight and branched alkylene containing, as a part thereof, a double bond, a triple bond or a radical $-(CH_2CH_2O)_y-CH_2-CH_2-$ wherein *y* is an integer of from 1 to 20, xylylene and cyclohexylene; R_1, R_2, R_3 and R_4 represent a lower alkyl group, or R_1 and R_2, and/or R_3 and R_4, when taken together with the nitrogen atoms to which they are attached, may form heterocyclic rings; and X represents a halogen atom, which are useful for pharmaceutical preparations and useful as a coagulating or flocculating agent for clarifying crude water in the reservoir for water supply, industrial water and sewage or drainage water are disclosed. The polymers are prepared by reacting a compound represented by the formula



wherein R_1, R_2, R_3, R_4 and A are as defined above, with a compound represented by the formula



wherein B and X are as defined above.

3,671,469
METHOD OF PREPARING HALOGEN-CONTAINING POLYMERS

Harold E. Doorenbos, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 20, 1969, Ser. No. 867,921
Int. Cl. C08f 3/20, 13/00
U.S. Cl. 260—2 H 9 Claims

Fluorine-, chlorine- and/or bromine-containing polymers are prepared by reacting

a. a monomer or mixture of monomers having the structural formula $R—CX_3)_n$, wherein *n* is an integer from 2 to 4, X is fluoro, chloro or bromo, and R is an *n*-valent hydrocarbon or halo-substituted hydrocarbon group, each $—CX_3$ group being an allylic or benzylic trihalomethyl group; with

b. CuX and/or CuX_2, wherein X has the above meaning, and

c. phosphorous acid, alkyl hydrogen phosphonate and/or a dialkyl hydrogen phosphonate.

The polymers are thermally stable at elevated temperatures and are useful as heat-resistant, fire-resistant films, coatings, ablatives and the like.

3,671,470

RIGID POLYURETHANE COMPOSITIONS WITH IMPROVED PROPERTIES

Leslie C. Case, 14 Lockeland Road, Winchester, Mass.

Filed April 27, 1970, Ser. No. 32,398
Int. Cl. C08g 22/06, 22/08, 22/44
U.S. Cl. 260—2.5 AP 35 Claims

Polyurethane formulations based on a polyol component which incorporates a hydroxyalkyl-substituted Mannich condensation product and a substantial quantity of cyclic hydrocarbon radicals are described. Such formulations yield rigid polyurethane foams which exhibit unusual inherent flame retardancy and exceptionally good dimensional stability under adverse conditions of temperature and humidity.

3,671,471

DIACID-DIOL BASED FOAMS AND PROCESS OF MAKING SAME

Saunders E. Jamison, Summit, N.J., assignor to Celanese Corporation

Filed May 4, 1970, Ser. No. 34,908
Int. Cl. C08f 47/08
U.S. Cl. 260—2.5 R 12 Claims

A rigid foam useful in insulating, molding and packaging, is prepared by (a) reacting a four to 10 carbon alpha-beta ethylenically unsaturated, dicarboxylic acid with a six to 50 carbon diol and (b) heating the resulting product to a temperature sufficient to effect decarboxylation of the resulting unsaturated diacid-diol adduct.

3,671,472

MINERAL-COATING COMPOSITIONS COMPRISING AN AMINE POLYMER AND AN AMYLACEOUS SUBSTANCE AND PAPERS COATED THEREWITH

Raymond W. McNamee, Horsham; Lubomir Mlynar, Hatboro, and Norman Schachat, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 7, 1968, Ser. No. 765,619
Int. Cl. C08f 45/06, 45/18
U.S. Cl. 260—17.4 ST 15 Claims

Mineral coating compositions for coating papers in which the binder comprises an amine-containing copolymer and an amylaceous substance. Improvement in wet rub resistance is obtained.

3,671,473

POLYMERS FORMED FROM THE REACTION OF A MIXTURE OF A POLYEPOXIDE AND A POLYESTER AND AN UNSYMMETRICAL DISUBSTITUTED HYDRAZINE

Edward A. Sedor, Bloomington, and Robert C. Slagel, Savage, both of Minn., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 714,322, March 19, 1968, Pat. No. 3,565,868. This application Nov. 12, 1970, Ser. No. 89,147
Int. Cl. C08g 45/00
U.S. Cl. 260—18 PF 11 Claims

Polymers comprising the reaction product of:

A. unsymmetrical disubstituted hydrazine and

B. a material selected from the group consisting of:

1. epoxy-esters having at least one reactive epoxide group and at least one reactive carboxylic acid ester group, and
2. mixtures of polyepoxides having a plurality of reactive epoxide groups and polyesters having a plurality of reactive ester groups.

These polymers find utility as decorative and/or protective coatings when applied to substrates.

3,671,474

WATER-THINNABLE CONDENSATION PRODUCTS AND THEIR USE AS PAINT BINDERS

William J. Van Westrenen, Delft, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed June 18, 1969, Ser. No. 834,531
Claims priority, application Great Britain, Jan. 13, 1969, 1,831/69
Int. Cl. C09d 3/56, 3/66, 5/24
U.S. Cl. 260—20 12 Claims

The disclosure describes novel condensation products having superior throwing power suitable as electrodeposition paint binders which are the partially neutralized reaction products of a polyepoxide and monocarboxylic acids containing at least 50 percent by weight of ethylenically unsaturated fatty acids, said reaction product having been further esterified with at least 4 percent by weight of an ethylenically unsaturated polycarboxylic acid or anhydride thereof and subsequently reacted with an oil-soluble, heat-non-reactive phenolic resin. The disclosure also describes the process for producing the above-described novel composition.

3,671,475

CROSS-LINKABLE UNSATURATED POLYMER COMPOSITIONS

Karl Brack, Hyde Park, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 658,060, Aug. 3, 1967, Pat. No. 3,592,784. This application Sept. 4, 1970, Ser. No. 69,946The portion of the term of this patent subsequent to July 13, 1988, has been disclaimed.
Int. Cl. C08f 27/08, 47/00
U.S. Cl. 260—22 R 8 Claims

A cross-linkable polymer composition is obtained by admixing an unsaturated polymer, a polyfunctional hydrazide halide of a specified formula, and material that provides upon contact with atmospheric moisture at least one alkaline reactant that reacts with the hydrazide halide to form the corresponding polyfunctional nitrile imine which in turn cross-links the unsaturated polymer.

3,671,476

ELECTRODEPOSITION COLOR COATING COMPOSITION AND METHOD FOR ELECTRODEPOSITION COLOR COATING OF METAL THEREWITH

Shiro Terai, Nagoya; Toshio Suzuki, Kasugai; Yoshihumi Hasegawa, Nagoya; Shojiro Horiguchi, Tokyo; Michiei Nakamura, Soka; Shizuo Kimata, and Tadanobu Suzuki, both of Nagoya, all of Japan, assignors to Sumitomo Light Metal Industries, Ltd.; Dainichiseika Color & Chemicals Mfg. Co., Ltd. and Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1970, Ser. No. 13,763
Claims priority, application Japan, March 1, 1969, 44/15038; Aug. 8, 1969, 44/62303
Int. Cl. C09d 3/74, 5/24; C23b 13/00
U.S. Cl. 260—23 AR 48 Claims

An electrodeposition-color-coating composition which comprises (A) a water-soluble vinyl copolymer containing as the essential constitutional elements of the copolymer 95 to 70 percent by weight of at least one α,β-ethylenically unsaturated monomer and an ammonium or amine salt of 5 to 30 percent by weight of at least one α,β-ethylenically unsaturated carboxylic acid, or a mixture of a major amount of said vinyl copolymer and a minor amount of a methylol melamine derivative compatible therewith, and (B) at least one member selected from the group consisting of (1) an ammonium or amine salt of a chromogen-bonded polymer obtained by reacting (a) a chromogen having diazonium group or α,β-ethylenically unsaturated group with (b) and α,β-ethylenically unsaturated carboxylic acid or a mixture of an α,β-ethylenically unsaturated carboxylic acid and other α,β-ethylenically unsatu-

rated monomer, (2) an ammonium or amine salt of a chromogen-bonded polymer prepared by reacting (a') a chromogen intermediate having a diazonium group or α,β-ethylenically unsaturated group, with the above-mentioned component (b) and subsequently subjecting the reaction product to development and (3) an aqueous dispersion of a pigment prepared by previously dispersing the pigment in water with a nonionic or an anionic surface active agent. Said composition can electrophoretically be coated on conductive metals, such as aluminum and an aluminum alloy in a known manner at a potential of 30 to 150 volts, followed by baking the coated metals at 120° to 230° C., whereby a light-fast, corrosion-resistant, colored and transparent coating having protective performances and beautiful appearance can be obtained.

3,671,477

COMPOSITION COMPRISING UNSATURATED ELASTOMER, EPOXY RESIN POLYCARBOXYLIC ACID OR ANHYDRIDE, CROSS-LINKING CATALYST AND FILLER AND GOLF BALL MADE THEREFROM

Robert Dennis Nesbitt, Don Mills, Ontario, Canada, assignor to Campbell Manufacturing Company Limited, Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 833,794, June 16, 1969, abandoned. This application Dec. 16, 1970, Ser. No. 98,930

Claims priority, application Canada, March 10, 1969, 045,249

Int. Cl. A63b *37/00*; C08d *9/08, 9/10*

U.S. Cl. 260—23.5 A **14 Claims**

A composition of matter particularly suitable for the manufacture of unitary molded golf balls consists of a blend of an unsaturated elastomer capable of being crosslinked by peroxide-initiated polymerization, an epoxy resin, a curing agent comprising unsaturated polycarboxylic acid or unsaturated polycarboxylic acid anhydride, a crosslinking catalyst for the elastomer and a filler material.

3,671,478

RUBBER COMPOSITIONS

George Mitchel Doyle, Sutton Coldfield; Robert Eric Humphreys, Birmingham, and Peter Lothar Ernst Moring, Sutton Coldfield, all of England, assignors to Dunlop Holding Limited, Birmingham, England

Continuation-in-part of Ser. No. 858,175, Sept. 15, 1969, abandoned. This application Nov. 9, 1970, Ser. No. 88,086

Claims priority, application Great Britain, Sept. 19, 1968, 44,463/68; Nov. 19, 1969, 56,675/69

Int. Cl. C08c *11/06*; C08d *9/00*

U.S. Cl. 260—23.7 M **18 Claims**

A vulcanizable composition which comprises natural rubber and/or synthetic rubber and a minor proportion of boric oxide. Preferably the amount of boric oxide is not greater than 20 parts by weight per 100 parts by weight of rubber.

3,671,479

BARRIER COATINGS

August F. Ottinger, St. Louis, and Paul R. Graham, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 718,367, April 3, 1968, Pat. No. 3,567,502. This application Feb. 26, 1971, Ser. No. 119,371

Int. Cl. C08f *29/22, 37/18*

U.S. Cl. 260—29.6 RW **9 Claims**

Composition comprising a polyblend of ethylene/vinyl chloride/acrylamide interpolymer and polyvinylidene-chloride useful as a flexible barrier coating for fibrous substrates.

3,671,480

HEAT-CURABLE ELASTOMERIC SILICONE COMPOSITIONS

Tadashi Wada, and Kunio Itoh, both of Annaka-shi, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed Dec. 18, 1969, Ser. No. 886,372

Claims priority, application Japan, Dec. 23, 1968, 43/94385

Int. Cl. C08g *51/04*

U.S. Cl. 260—29.1 SB **8 Claims**

A heat curable elastomeric silicone composition comprising a mixture of two polydiorganosiloxanes, each of which contains vinyl unsaturation; a silica filler; a polyorganohydrogensiloxane and a platinum compound; and a method for the preparation of vulcanizates thereof. The composition is cured for a period up to about one hour and is then post-cured for up to about 24 hours to yield a vulcanized elastomer having high tear strength, flame retardance, heat resistance and superior compression set.

3,671,481

TRIMELLAMIDE-IMIDES SOLUTIONS

Jean Gattus, La Mulatiere, and Maurice Mallet, Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed July 2, 1970, Ser. No. 52,072

Claims priority, application France, July 4, 1969, 6922817

Int. Cl. C08g *51/44*

U.S. Cl. 260—30.2 R **7 Claims**

Solutions of trimellamide-imides in non-hydroxylic polar solvents containing an aromatic anhydride and an aromatic diamine are useful for making films which can be easily detached from metallic supports.

3,671,482

POLYMER SOLUTIONS OF POLYAMINO ACIDS AND THE PROCESS FOR THEIR PREPARATION

Yasuo Fujimoto, Machida-shi; Koichi Nagaoka, Tokyo; Keizo Tatsukawa, Machida-shi, and Yoichi Koiwa, Tokyo, all of Japan, assignors to Kyava Hakko Kogyo Co., Ltd., Tokyo, Japan

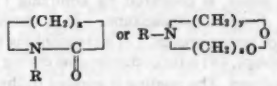
Filed April 3, 1969, Ser. No. 813,308

Claims priority, application Japan, April 4, 1968, 43/21788

Int. Cl. C08g *20/08, 51/44*

U.S. Cl. 260—30.4 N **14 Claims**

The present disclosure is directed to a polymer solution and a process for preparing the same which comprises a polyamino acid or polyamino acid ester and a solvent for said polymer, said solvent including at least one N-containing heterocyclic compound selected from the group consisting of:



wherein x is an integer of 2 to 4, y and z are integers, including zero, which satisfy the formula $y+z<6$, and R is hydrogen, an alkyl group having about one to eight carbon atoms, a phenyl group or a tolyl group, including those having one to three substituents selected from the group consisting of halogen and nitro.

3,671,483

PRIMER COMPOSITION FOR ADHERING SILICONE ELASTOMER TO SUBSTRATES

Donald G. Young, Glendale, Ky., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 30,346, April 20, 1970, abandoned. This application Dec. 30, 1970, Ser. No. 103,004

Int. Cl. C08g *51/34, 51/28, 51/30*

U.S. Cl. 260—32.8 SB **10 Claims**

A mixture of tetraalkoxysilane or partial hydrolyzate thereof, a tetraalkyltitanate, a compound of the formula

$CF_3CH_2CHSi[OSi(CH_3)_2X]_3$ where X is a hydrogen atom or $-CH_2CH_2Si(OOCCH_3)_3$ and at least one X is a $-CH_2CH_2Si(OOCCH_3)_3$ and an organic solvent is useful as a primer in adhering silicone elastomer to substrates such as epoxy resins and polyurethane. An example of the primer is one part each of ethylpolysilicate, tetrabutyltitanate and $CF_3CH_2CH_2Si[OSi(CH_{32}CH_2CH_2Si(OOCCH_3)_3]_3$ and 10 parts of acetone.

3,671,484

SILICONE RELEASE COATINGS

Kenneth G. Cooper, Herbert T. Cooper, and Colin M. Rowland, all c/o Midland Silicones Limited, Reading England

Filed July 20, 1970, Ser. No. 56,686

Claims priority, application Great Britain, July 23, 1969, 37,055/69

Int. Cl. C08g *51/28*

U.S. Cl. 260—33.6 SB 7 Claims

Abrasion resistant coatings for paper and other substrates are prepared by admixing in an organic solvent, (a) 100 parts by weight of a substantially linear diorganopolysiloxane having methyl radicals as at least 80 percent of the organic substitutes on silicon, the remaining organic substituents being hydrocarbyl radicals of up to 18 carbon atoms, the terminal groups on the siloxane being hydrocarbyl, hydroxyl or alkoxyl radicals, (b) 1.5 to 15 parts by weight of alkylhydrogenpolysiloxane having a molecular weight not exceeding about 5,000, (c) 3 to 34 parts by weight of tin acylate, (d) 2 to 8 parts by weight of an aminated organopolysiloxane of the general formula $R_3SiO(CH_3R'SiO)_x(CH_3XSiO)_y(R''_2SiO)_zSiR_3$ where R and R'' are hydrocarbyl radicals, R' is an alkoxy or alkoxyalkoxy radical of less than six carbon atoms, X is $-R'''NQH$ where R''' is an alkylene radical of three to 10 carbon atoms, Q is a hydrogen atom, trihydrocarbylisilyl radical or a hydrocarbyl radical of less than seven carbon atoms, X is 15 to 95, y is 2 to 25, z is up to 10 percent of the sum of $x+y$ and the sum of $x+y+z$ is 20 to 100.

3,671,485

ABHESIVE COATINGS COMPRISING POLYSIBOXANES

Heinrich Marwitz, and Siegfried Nitzsche, both of Burghausen, upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany

Filed July 9, 1970, Ser. No. 53,630

Int. Cl. C08g *51/34*, *51/28*

U.S. Cl. 260—33.4 SB 9 Claims

An abhesive or release coating for a variety of substrates, particularly paper, is prepared by admixing (1) a hydroxyl endblocked diorganopolysiloxane, (2) a crosslinking alkoxysilane free of amino groups, (3) a crosslinking silane containing amino groups, (4) a tin compound as curing catalyst in (5) an organic solvent. The coating is applied to the substrate and can be cured in the absence of moisture.

3,671,486

FILLED FUSIBLE AROMATIC PREPOLYMER COMPOSITION

David Rodney Dixon, Dunstable; John Brewster Rose, Letchworth, both of England, and Cecil Nigel Turton, Stamford, Conn., assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 751,768, Aug. 12, 1968, abandoned. This application Jan. 27, 1970, Ser. No. 6,274

Claims priority, application Great Britain, Aug. 18, 1967, 38,220/67; Feb. 17, 1969, 8,571/69

Int. Cl. C08g *51/04*, *51/08*

U.S. Cl. 260—37 N 6 Claims

Mixtures of aromatic tetracarboxylic dianhydrides and/or aromatic tricarboxylic anhydrides and urethane or urea derivatives of aromatic diamines, and soluble and fusible prepolymers obtained therefrom, are useful intermediates for fabricating polyimide articles.

3,671,487

GLASS REINFORCED POLYESTER RESINS CONTAINING POLYTETRAFLUOROETHYLENE AND FLAME RETARDANT ADDITIVES

Visvaldis Abolins, Delmar, N.Y., assignor to General Electric Company

Filed May 5, 1971, Ser. No. 140,596

Int. Cl. C08k *1/78*

U.S. Cl. 260—40 R 20 Claims

Flame retardant thermoplastic molding compositions are provided comprising a normally flammable linear polyester, filamentous glass, a flame retardant agent and a polytetrafluoroethylene resin. The use of the polytetrafluoroethylene resin controls dripping and permits the flame retardant agent to be used in amounts sufficient to render the compositions non-burning or self-extinguishing without detracting from their physical properties.

3,671,488

THERMAL STABILIZATION OF ADDITION POLYMERS

Dagobert E. Stuetz, Westfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 19, 1966, Ser. No. 551,222

Int. Cl. C08g *51/58*

U.S. Cl. 260—45.7 R 1 Claim

A composition comprising an addition polymer and a stabilizing amount of a compound selected from the group consisting of 9,10-dihydroanthracene, (1-8)-octahydroanthracene, phenanthrene, (1-8)-octahydrphenanthrene, acenaphthylene and (1-4)-tetrahydroacenaphthene.

3,671,489

POLYSILOXANE COPOLYMERS DERIVED FROM THE CARBORANE-SILICON PHTHALOCYANINE MONOMER

Robert L. Barnes, Clifton, N.J.; William M. Block, Staten Island, N.Y., and Daniel Grafstein, Morristown, N.J., assignors to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 619,199, Feb. 28, 1967, abandoned. This application Dec. 15, 1969, Ser. No. 885,335

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 E 1 Claim

Polysiloxane copolymers derived from the carborane - silicon phthalocyanine monomer. Said copolymers are useful as high temperature stable coatings, adhesives, molding compounds, for electronic components and laminating resins.

3,671,490

CROSS-LINKED POLYIMIDES

Michel Bargain, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Continuation-in-part of Ser. No. 743,010, July 8, 1968, Pat. No. 3,575,924. This application Jan. 22, 1971, Ser. No. 108,973

Claims priority, application France, July 12, 1967, 67114135

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 CP 4 Claims

The invention provides novel cross-linked polyimides made by reacting a dianhydride with a molar excess of diamine, reacting the product with an unsaturated anhydride to produce an unsaturated polyamide, and heating the latter to produce the cross-linked polyimide.

3,671,491

RANDOM BENZIMIDAZOLE-BENZOXAZOLE COPOLYMERS AND METHODS OF PREPARATION

John T. Loft, Springfield; Anthony B. Conciatori, Chatham, and Edward C. Chenevey, North Plainfield, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed March 26, 1969, Ser. No. 810,813

Int. Cl. C08g *33/02*

U.S. Cl. 260—47 CP 12 Claims

Random copolymers which consist essentially of from about 90 to about 10 percent of recurring benzimidazole structural units and correspondingly from about 10 to about 90 percent of recurring benzoxazole structural units are provided. Several polymerization methods including, for example, a two stage melt-solid state procedure, are described.

3,671,492

1:1 ALTERNATING COPOLYMERS OF CARBONYL OR THIOCARBONYL-CONTAINING NON-CONJUGATED COMPOUNDS AND CONJUGATED COMPOUNDS AND METHOD OF PREPARATION

Kohei Nakaguchi, Osaka; Shohachi Kawasumi, Kobe; Masaaki Hirooka, Ibaraki; Hiroshi Yabuuchi, Takatsuki, and Hiroyoshi Takao, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan

Continuation of Ser. No. 567,392, June 25, 1966, abandoned. This application March 16, 1970, Ser. No. 20,087

Claims priority, application Japan, July 26, 1965, 40/45480; July 30, 1965, 40/46495; June 2, 1966, 41/35763

Int. Cl. C08f *3/40, 3/42, 3/74*

U.S. Cl. 260—85.5 ES 10 Claims

A novel alternating copolymer is prepared by copolymerizing a compound having a polar group, such as a carbonyl or thiocarbonyl group, at a non-conjugated position and a conjugated vinyl compound in the presence of an organoaluminum halide. Alternating copolymers thus-produced are superior in thermal stability to conventional random copolymers and is resistant to coloration. Alternating copolymers obtained by copolymerizing vinyl acetate and methyl acrylate or acrylonitrile are preferred examples of these products.

3,671,493

FLUOROCARBON-CONTAINING COMPOUNDS AND METHOD OF IMPARTING OIL- AND WATER-REPELLENCY TO TEXTILES, PAPER, LEATHER AND THE LIKE

Sergio Lo Monaco, Piazzale Roma 13, Vicenza; Alfredo Guerrato, Via Panisacco 2; Dario Fabbro, Via Verdis 3, both of Trissino, and Graziello Donadello, Via S. Christoforo 9 B, Valdagno, all of Italy

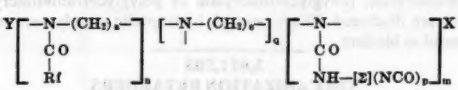
Filed April 7, 1970, Ser. No. 26,263

Claims priority, application Italy, April 16, 1969, 51444 A/69

Int. Cl. C08g *22/04, 53/16;* D06m *15/52*

U.S. Cl. 260—75 NH 6 Claims

Compounds represented by a formula:



comprising a perfluorinated hydrocarbon chain Rf and a polyester— or polyether urethane chain [Σ] carrying free —NCO groups; and precursors of said compounds, wherein the —NCO groups are temporarily blocked by phenol or another suitable blocking agent.

3,671,494

THERMALLY STABLE POLYESTERS FIBERS HAVING INHERENT DISPERSE DYE UPTAKE AND OIL STAIN RELEASE PROPERTIES

Henry L. King; Eugene L. Ringwald, both of Cary, N.C., and James C. Randall, Jr., Bartlesville, Okla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 789,528, Jan. 7, 1969, abandoned, and a continuation-in-part of Ser. No. 824,092, May 13, 1969, and a continuation-in-part of Ser. No. 874,638, Nov. 6, 1969. This application May 5, 1970, Ser. No. 34,742. The portion of the term of this patent subsequent to June 6, 1989, has been disclaimed.

Int. Cl. C08g *17/08*

U.S. Cl. 260—77 14 Claims

Thermally stable fiber-forming polyesters having superior inherent oil-stain release properties are obtained by heat-setting at temperatures of from about 300°F. to about 350°F., filaments or fabrics produced from dicarboxylic acids, or reactive derivatives thereof, glycols and small amounts of mixtures of compounds having a typical general formula: R—O[G-O]$_x$—H, where R is an alkyl group containing an average of at least 8 carbon atoms; G is a hydrocarbon radical selected from the group consisting of ethylene, propylene and isomers thereof, and mixtures of the above; and x has an average value of at least equal to or greater than 9, and no greater than about 20.

3,671,495

THERMALLY STABLE POLYESTER FIBERS HAVING INHERENT DISPERSE DYE UPTAKE AND SUPERIOR OIL STAIN RELEASE PROPERTIES

Henry L. King; Eugene L. Ringwald, both of Cary, N.C., and James C. Randall, Jr., Bartlesville, Okla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 789,528, Jan. 7, 1969, abandoned, and a continuation-in-part of Ser. No. 824,092, May 13, 1969, and a continuation-in-part of Ser. No. 874,638, Nov. 6, 1969, and a continuation-in-part of Ser. No. 34,742, May 5, 1970, and a continuation-in-part of Ser. No. 32,675, April 28, 1970. This application May 22, 1970, Ser. No. 41,243

Int. Cl. C08g *17/08*

U.S. Cl. 260—77 14 Claims

Thermally stable fiber-forming polyesters having superior inherent oil-stain release properties are obtained by heat-setting at temperatures of from about 175° F. to about 375° F., filaments or fabrics produced from dicarboxylic acids, or reactive derivatives thereof, glycols and small amounts of mixtures of compounds having a typical general formula: R—O[G—O]$_x$—H, where R is an alkyl group containing an average of about eight to 20 carbon atoms; G is a hydrocarbon radical selected from the group consisting of ethylene, propylene and isomers thereof, and mixtures of the above; and x has an average value of at least equal to or greater than 9, no greater than about 20, and about equal to or greater than R.

3,671,496

PROCESS FOR PREPARING RESINOUS COMPOSITIONS

Hiromasa Masuda, Osaka; Eiiti Nishigaki, Nishinomiya, and Tomosuke Maeda, Osaka, all of Japan, assignors to Nippon Yushi Kabushiki Kaisha, Cheyoda-ku, Tokyo, Japan

Division of Ser. No. 717,440, March 29, 1968, abandoned. This application Sept. 8, 1970, Ser. No. 70,482

Claims priority, application Japan, April 3, 1967, 42/20762

Int. Cl. C08q *22/08*

U.S. Cl. 260—77.5 CR 4 Claims

A polyurethane composition comprising the reaction product of an acrylic polymer comprising:

Component A

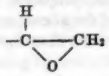
A monomer having

bond and further having —OH,

—$CONH_2$,—$CONHCH_2OH$ or —$CON(CH_2OH)_2$ groups,
Component B
A monobasic or polybasic acid having a

bond,
Component C
An alkyl ester of an α,β -unsaturated carboxylic acid, or a compound having a

group but which is free of —OH, —COOH and ester groups, or



compound free of H_2C = C such as the glycidyl ester of versatic acid; and a diisocyanate such as xylene diisocyanate or a prepolymer thereof.

3,671,497

POLYURETHANE RESINS FROM HYDROXY TERMINATED PERFLUORO ETHERS

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; Eugene C. Stump, Jr., Gainesville, Fla., and Stephen Eugene Rochow, Ann Arbor, Mich.

Division of Ser. No. 770,398, Oct. 24, 1968, Pat. No. 3,574,770. This application Dec. 18, 1970, Ser. No. 99,524

Int. Cl. C08g *22/14, 22/16*

U.S. Cl. 260—77.5 AP **4 Claims**

Hydroxy terminated perfluoro ethers and polyurethane resins incorporating the structure

$$-CH_2C+(CF_3)[OCF_2CF(CF_3)](CF_2)_pO[CF(CF_3)CF_2O]_n CF(CF_3)CH_2-$$

where p is an integer of 2 to 12 and
m and n are integers whose sum is from 0 to 20.

3,671,498

COPOLYAMIDES FROM BIS(AMINOPHENYL)SULFONE

Michael Horace Knight, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed April 17, 1970, Ser. No. 29,699

Claims priority, application Great Britain, May 2, 1969, 22,508/69

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R **8 Claims**

The color of polyamides of bis(aminophenyl)sulphones and α,ω-polymethylene dicarboxylic acids having from six to 16 carbon atoms in all, or mixtures of these acids with up to 25 mole percent of one or more other dicarboxylic acids, may be improved by replacing from 4 to 20 mole percent of the bis(aminophenyl)sulphone with a linear or branched alkylene diamine having the structure $NH_2CH_2(CR_1R_2)_mCH_2NH_2$ where each R_1 and R_2 is hydrogen or an alkyl group having up to four carbon atoms and m is from 0 to 10 inclusive.

3,671,499

LACTAM POLYMERIZATION WITH ALLOPHANOYL HALIDE INITIATORS

Charles E. Moyer, Jr., Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 9, 1970, Ser. No. 53,683

Int. Cl. C08g *20/12, 20/18*

U.S. Cl. 260—78 L **11 Claims**

An allophanoyl halide compound is used as an initiator or activator with alkaline catalyst in the anionic polymerization of lactam monomer so as to provide for a rapid polymerization process.

3,671,500

LACTAM POLYMERIZATION WITH N,N'-DIALKYL-AZETIDINEDIONE INITIATORS

Herbert E. Johnson, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 9, 1970, Ser. No. 53,684

Int. Cl. C08g *20/12, 20/18*

U.S. Cl. 260—78 L **15 Claims**

An N,N'-dialkyl-azetidinedione compound is used as an initiator or activator with alkaline catalyst in the anionic polymerization of lactam monomer so as to provide for a rapid polymerization process.

3,671,501

LACTAM POLYMERIZATION WITH SUBSTITUTED BIURET INITIATORS

Herbert E. Johnson, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 9, 1970, Ser. No. 53,667

Int. Cl. C08g *20/12, 20/18*

U.S. Cl. 260—78 L **6 Claims**

A substituted biuret compound is used as an initiator or activator with alkaline catalyst in the anionic polymerization of lactam monomer so as to provide for a rapid polymerization process.

3,671,502

BETAINE COPOLYMERS WITH HYDROXYALKYLACRYLATES AND HYDROXYALKYLMETHACRYLATES

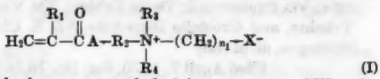
Carlos M. Samour, Wellesley, and Martin L. Falxa, Cambridge, both of Mass., assignors to The Kendall Company, Wolpole, Mass.

Filed Nov. 12, 1970, Ser. No. 89,108

Int. Cl. C08f *15/00, 15/16*

U.S. Cl. 260—79.3 MU **6 Claims**

Copolymers of carboxybetaines or sulfobetaines having the formula



(I)

wherein R_1 is hydrogen or methyl; A is oxygen or —NH—; R_2 is ethylene, propylene, 2-hydroxypropylene or 2-acetoxypropylene; R_3 and R_4 are alkyl; n_1 is 1 to 4 and X^- is SO_3^- or CO_2^-; and about 10 to about 95.0 per cent by weight of hydroxyethylacrylate, hydroxyethylmethacrylate, hydroxypropylacrylate, hydroxypropylmethacrylate, polyethylene glycol acrylate, polyethylene glycol methacrylate, polypropylene glycol acrylate, polypropylene glycol methacrylate, polyglycerolacrylate or polyglycerolmethacrylate are disclosed. These neutral, hydrophilic copolymers are useful as binders.

3,671,503

VULCANIZATION RETARDERS

Rudiger Schubart; Ernst Roos, both of Cologne, and Manfred Abele, Porz, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 18, 1970, Ser. No. 90,859

Claims priority, application Germany, Dec. 13, 1969, P 19 62 604.1

Int. Cl. C08f *27/06;* **C08c** *11/60, 11/54*

U.S. Cl. 260—79.5 B **4 Claims**

N,N'-thio-bis-carbamic acid amides, their preparation by reacing at least 2 mols of a carboxylic acid amide with 1 mol of

sulphur dichloride in the presence of an acid binding agent and their utility as rubber vulcanization retarders.

3,671,504

METHOD FOR ELECTROSTATICALLY COATING SYNTHETIC RESIN MOLDINGS

Hideo Marumo; Morio Ninomiya, both of Tokyo, and Shinro Watanabe, Ichikawa, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

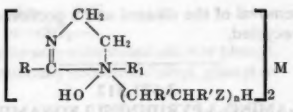
Continuation of Ser. No. 687,993, Dec. 5, 1967, abandoned. This application Dec. 21, 1970, Ser. No. 100,346

Claims priority, application Japan, Dec. 8, 1966, 41/80070

Int. Cl. C08f *1/88*

U.S. Cl. 260—80.7 **6 Claims**

Electrostatic coating of synthetic resin moldings is simplified by mixing in the synthetic resin from 0.1–5 wt. % of an amphoteric surface active agent of the formula



wherein:

R is a hydrocarbon radical having seven to 21 carbon atoms,

R′ is selected from the group consisting of H and —CH_3,

Z is selected from the group consisting of —O— and —N-H—,

M is a metal ion selected from the group consisting of Mg, Ca, Zn, Ba and Fe,

R_1 is selected from the group consisting of —R_2COO—, —R_2SO_3— and —R_2OSO_3— (where R_2 is selected from the group consisting of —CH_2—, —C_2H_4— or —C_3H_6—),

n is a number from 0 to 3.

3,671,505

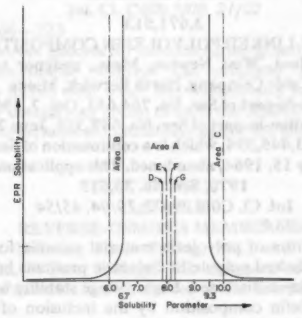
SUSPENSION POLYMERIZATION METHOD FOR PREPARING ELASTOMERIC HYDROCARBON INTERPOLYMERS

Albert Schrage, East Orange, and Jules Ernest Schoenberg, Bergenfield, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed June 27, 1968, Ser. No. 740,692. **The portion of the term of this patent subsequent to July 21, 1987, has been disclaimed.**

Int. Cl. C08f *15/04, 15/40*

U.S. Cl. 260—80.78 **10 Claims**



A process is provided for preparing ethylene-propylene-diene terpolymers in suspension employing a normally liquid hydrocarbon such as cyclohexane and liquid propylene, the amount of liquid hydrocarbon ranging from 10 to 50 percent by volume and liquid propylene ranging from 50 to 90 percent by volume, this polymerization system resulting in no reactor fouling.

3,671,506

SULFUR CURABLE COPOLYMERS OF OLEFINS

Teruo Oshima, Nishinomiya-shi; Takeshi Wada, Takatsuki-shi; Tsuneyuki Nagase, Takatsuki-shi; Fujio Masuko, Takatsuki-shi; Masaaki Hirooka, Ibaragi-shi, and Isoji Taniguchi, Toyonaka-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Feb. 4, 1969, Ser. No. 796,610

Claims priority, application Japan, Feb. 8, 1968, 43/8057

Int. Cl. C08f *19/00*

U.S. Cl. 260—80.78 **12 Claims**

A linear copolymer having a high sulfur curing rates is prepared by contacting substantially exo-type 5-alkenyl-2-norbornene compound and ethylene and/or α-olefin having three to 20 carbon atoms with a catalyst consisting essentially of an organoaluminum compound and vanadium compound and/or titanium compound, both said vanadium compound and titanium compound having at least trivalencies, in the presence or absence of an inactive reaction medium. Particularly, terpolymers comprising ethylene, propylene and substantially exo-type 5-alkenyl-2-norbornene have excellent characteristics as elastomers.

3,671,507

METHOD FOR POLYMERIZATION OF N-VINYLCARBAZOLE

Tetsuo Tanaka, Kasukabe; Masao Masumura, Tokyo; Akihiro Toguchi, Tokyo, and Nario Yamaguchi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Continuation-in-part of Ser. No. 813,339, April 3, 1969, abandoned. This application July 12, 1971, Ser. No. 161,884

Int. Cl. C08f *7/16*

U.S. Cl. 260—88.3 R **6 Claims**

N-vinylcarbazole is bead polymerized in a polymerization reaction mixture made by mixing (1) molten monomer of N-vinylcarbazole suspended in water with a dispersant and (2) a solution of a free radical catalyst in sufficient water insoluble organic solvent to maintain the catalyst and a substantial amount of monomer in suspended droplet form, said solvent having a specific gravity of 1.0 or more; and then agitating vigorously the mixture of (1) and (2) at a temperature above the melting point of N-vinylcarbazole in an inert atmosphere.

3,671,508

METHOD FOR PREPARING POLYVINYL CHLORIDE

Shunichi Koyanagi, Naoestu; Hajime Kitamura, Saigata, and Shigenobu Tajima, Naoetsu, all of Japan, assignors to Shinetsu Chemical Company

Filed March 1, 1971, Ser. No. 120,041

Claims priority, application Japan, Sept. 30, 1970, 45/85120

Int. Cl. C08f *1/11, 3/30, 15/02*

U.S. Cl. 260—87.1 **6 Claims**

Vinyl chloride is suspension polymerized in the presence of a catalyst selected from the group consisting of dialkyl peroxy dicarbonate, azo-bis-2,4-dimethyl valeronitrile, azo-bis-2,4,4-trimethyl valero nitrile, azo-bis-4-methoxy-2,4-dimethyl valeronitrile, and acetyl cyclohexyl sulfonyl peroxide, a suspending agent, a fatty alcohol having from eight to 18 carbon atoms and sorbitan oleate. When the rate of conversion reaches at least 50 percent, an organic reducing agent is added to the polymerization system. A polyvinyl chloride having superior particle size distribution, plasticizer absorption, fish eye, initial color and thermal stability is produced.

3,671,509
COPOLYMERS OF FLUOROKETONE IMINES WITH POLYMERIZABLE UNSATURATED COMPOUNDS

Edward G. Howard, Jr., Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 748,660, July 30, 1968, abandoned. This application March 22, 1971, Ser. No. 126,923

Int. Cl. C08f 3/04, 3/76, 7/04

U.S. Cl. 260—87.5 25 Claims

Copolymers of fluoroketone imines with one or more polymerizable olefinic compounds, e.g., a binary copolymer of hexafluoroacetone imine and ethylene or a terpolymer of N-methylhexafluoroacetone imine, ethylene and tetrafluoroethylene, useful as supported and unsupported films and as encapsulating agents, are prepared by reacting a fluoroketone imine with one or more polymerizable olefinic compounds.

3,671,510
METHOD FOR POLYMERIZATION OF FLUORINE-CONTAINING HALOOLEFINS

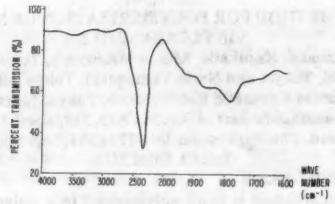
Yutaka Kometani, Nishinomiya; Masayoshi Tatemoto, and Masanori Nakamura, both of Osaka-fu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka-shi, Osaka-fu, Japan

Filed April 21, 1970, Ser. No. 30,572

Claims priority, application Japan, April 21, 1969, 44/31128

Int. Cl. C08f 1/60, 1/11, 3/20

U.S. Cl. 260—87.5 A 6 Claims



A method for polymerization of fluorine-containing haloolefins which comprises subjecting one or more kinds of polymerizable fluorine-containing haloolefins to suspension polymerization in an aqueous medium in the presence of di(perchlorofluoroacyl) peroxide of the formula:

$$Cl(CF_2CFCl)_nCF_2C(=O)-O-O-C(=O)CF_2(CF_2CFCl)_nCl$$

wherein n is an integer of 1 to 10. Compared with known organic peroxides, the polymerization initiator of the present invention is advantageous in affording polymers of high molecular weight in excellent yields.

3,671,511
PROCESS FOR PREPARING POLYOLEFIN-SUBSTITUTED AMINES

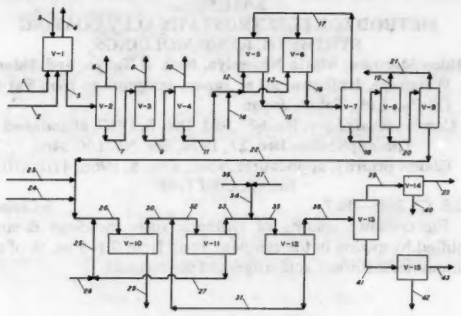
Lewis R. Honnen, 100 Sadler Lane, Petaluma, Calif.; Harry W. Andrewsen, 795 Los Colindas Rd., San Rafael, Calif., and Eddie G. Lindstrom, deceased, late of Martinez, Calif. (by Jean H. Lindstrom, special administratrix)

Filed April 23, 1970, Ser. No. 31,298

Int. Cl. C08f 27/08, 314, 27/02

U.S. Cl. 260—93.7 6 Claims

Polyolefin-substituted amines are prepared by chlorinating the polyolefin in an inert medium, removing the inert medium from the chlorinated polyolefin, reacting the chlorinated polyolefin with an excess of amine, removing excess amine for recycle by distillation under vacuum, and finishing the product by charging a diluent and an alkanol and washing, followed by removal of the alkanol and a portion of the diluent which are recycled.



3,671,512
6-AMINO-3-PYRIDINESULFONAMIDES

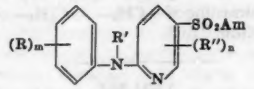
Renat Herbert Mizzoni, Long Valley R.D., and Herbert Morton Blatter, Summit, both of N.J., assignors to Aba-Geigy Corporation, Summit, N.J.

Filed April 1, 1970, Ser. No. 24,869

Int. Cl. C07d 31/48

U.S. Cl. 260—294.8 F 4 Claims

New 6-anilino-3-pyridinesulfonamides, e.g. those of the formula



R = H, alkyl, free, esterified or etherified OH, CF_3, NO_2, amino, free or functionally converted carboxy or sulfo
R′ = H, alkyl or acyl
R″ = H or alkyl
Am = an amino or hydrazino group
m = 1–3 N = 1 or 2

the N-oxide and salts thereof, are antiinflammatory agents.

3,671,513
CROSS-LINKED POLYOLEFIN COMPOSITION

George H. Hunt, West Newton, Mass., assignor to Simplex Wire and Cable Company, North Berwick, Maine

Continuation-in-part of Ser. No. 764,651, Oct. 2, 1968, which is a continuation-in-part of Ser. No. 649,355, June 27, 1967, Pat. No. 3,445,394, which is a continuation of Ser. No. 367,718, May 15, 1964, abandoned. This application April 30, 1970, Ser. No. 33,515

Int. Cl. C08f 29/02, 29/04, 45/54

U.S. Cl. 260—93.7 4 Claims

A composition of polyolefin material suitable for production of cross-linked polyolefin dielectric products having high voltage stability is disclosed. High voltage stability is imparted to the polyolefin composition by the inclusion of any of a number of known substituted aromatic compounds and resistance to sag during cross-linking operation is provided by the inclusion of a polychlorinated biphenyl in an amount up to about 10 parts by weight per 100 parts of polyolefin.

3,671,514
PHENYL-AZO-NAPHTHOL COMPOUNDS OF LOW SOLUBILITY

Willy Forter, Allschwil/Basel, Switzerland; Armand Henrard, Gand, Belgium; Fritz Kehrer, Basel, Switzerland; Urs Martin Keller, Binningen/Basel, Switzerland, and Hans Wasem, Basel, Switzerland, assignors to Sandoz Ltd., (a/k/a Sandoz A.G.), Basel, Switzerland

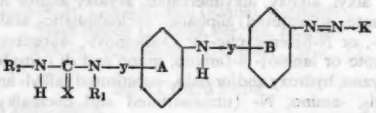
Filed Feb. 6, 1969, Ser. No. 797,235

Claims priority, application Switzerland, Feb. 20, 1968, 2458/68

Int. Cl. C07c *107/04, 107/06*

U.S. Cl. 260—203 9 Claims

Monoazo pigments of the formula



(II)

wherein

X is = O, = S or = NH,

y is —CO— or —SO_2—,

R_1 is H or optionally substituted alkyl or phenyl,

R_2 is H or optionally substituted alkyl, phenyl or

K is a 2-hydroxy-3-naphthoic acid phenyl- or naphthylamide, wherein the phenyl or naphthyl of the amide radical may be further substituted, and the rings A and B may be further substituted;

are suitable for the pigmentation of plastics and synthetic resins, e.g. polyethylene, polystyrene, polyvinyl chloride, and of rubber, synthetic leather, printing inks and surface coatings. In addition they can be employed for the spin dyeing of viscose rayon and cellulose acetate, and for pigment printing, paper dyeing in the stock, and the coloration of coating mixtures applied to textiles. In these materials they are of yellow to red shade and show outstandingly good light and migration fastness, along with good to very good fastness to washing, chlorite, hypochlorite and peroxide bleaching, cross dyeing, blind vats, hydrosulphite, dry cleaning, rubbing over-spraying and sulphates. They show good transparency and heat stability

3,671,515
SPHERICAL PRODUCTION OF SMALL PARTICLE NITROCELLULOSE

Charles D. Cox, Bryans Road, and Thomas Liggett, Indian Head, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 20, 1970, Ser. No. 39,171

Int. Cl. C08b *5/00, 21/02*

U.S. Cl. 260—223 8 Claims

An improved process for manufacturing spherical small particle nitrocellulose wherein the prepared nitrocellulose lacquer is mixed with water and immediately subjected to a high shear emulsifying action to form the desired particles. No colloids, surfactants or emulsifying agents are employed in the process.

3,671,516
REVERSE-OSMOSIS MEMBRANES

Juanita J. Hillman, Silver Spring, Md., and Raymond H. Horowitz, Willow Springs, Ill., assignors to The United States of America as represented by the Secretary of the Interior

Filed March 2, 1971, Ser. No. 120,361

Int. Cl. C08b *1/02, 3/00*

U.S. Cl. 260—229 4 Claims

Reverse-osmosis membranes are prepared by surface acetylation of cellulose film. A pre-treatment consisting of exposure of the film to high relative humidity, prior to acetylation, is employed to provide superior salt rejection.

3,671,517
PREPARATION OF 2,3,4,5-TETRAHYDRO-5-PHEN-YL-1H-1,4-BENZODIAZEPINES AND INTERMEDIATES

Giles Allan Archer, 88 Fells Road, Essex Fells, N.J., and Leo Henryk Sternbach, 10 Woodmont Road, Upper Montclair, N.J.

Division of Ser. No. 744,337, July 12, 1968, abandoned. This application Dec. 17, 1970, Ser. No. 99,326

Int. Cl. C07d *53/06*

U.S. Cl. 260—239 BD 2 Claims

2,3,4,5-Tetrahydro-5-phenyl-1H-1,4-benzodiazepines are prepared from corresponding 5-desphenyl, 4,5-unsaturated benzodiazepines by treatment of the latter compounds with an organo metallic phenyl compound. The product compounds are useful as intermediates in the preparation of medicinally valuable 5-phenyl-2,3-dihydro-1H-1,4-benzodiazepines. Methods for preparing the 5-desphenyl, 4,5-unsaturated 1H-1,4-benzodiazepines are provided and intermediates useful in such preparation are identified.

3,671,518
BENZODIAZEPIN-2-ONES AND PROCESSES FOR THEIR PREPARATION

Joseph Hellerbach; Andre Szente, both of Basel, Switzerland, and Armin Walser, West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed March 6, 1970, Ser. No. 17,318

Claims priority, application Switzerland, March 13, 1969, 3784/69; April 30, 1969, 6595/69

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D 16 Claims

3-substituted benzodiazepin-2-ones, derivatives thereof and processes for their preparation are described. These compounds are useful as anti-convulsants, muscle relaxants and sedatives.

3,671,519
N-SUBSTITUTED 2,3,4,5,-TETRAHYDRO-1H-3-BENZAZEPINES

Joseph Tokolics, King of Prussia; Gordon A. Hughes, Haverford, and Herchel Smith, Wayne, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 572,676, Aug. 16, 1966, Pat. No. 3,483,185. This application July 14, 1969, Ser. No. 860,449

Int. Cl. C07d *41/08*

U.S. Cl. 260—239 BB 10 Claims

N-substituted-2,3,4,5-tetrahydro-1H-3-benzazepines are prepared having pharmacological activity including analgesic and hypoglycemic action.

3,671,520
ANTIMICROBIAL INDANONES

Rudolf Albrecht; Hans-Joachim Kessler, and Eberhard Schroder, all of Berlin, Germany, assignors to Schering AG, Berlin und Bergkamen, Berlin, Germany

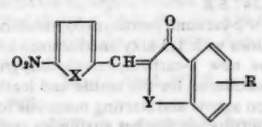
Filed March 27, 1970, Ser. No. 23,487

Claims priority, application Germany, March 29, 1969, P 19 16 825.3; Oct. 29, 1969, P 19 55 386.7

Int. Cl. C07d *99/04*

U.S. Cl. 260—240 A 21 Claims

Compounds of the formula



wherein X is O, S or NH, Y is —CH_2— and R is nitro, benzoyloxy, alkoxycarbonyloxy, N-mono-alkylaminocarbon-

yloxy, N,N-dialkylaminocarbonyloxy or an N-substituted-aminoalkoxy group, having antimicrobial activity, e.g., against *Trichomonas vaginalis*.

3,671,521

2-HETEROCYCLIC SUBSTITUTED QUINXALINE-1, 4-DIOXIDES

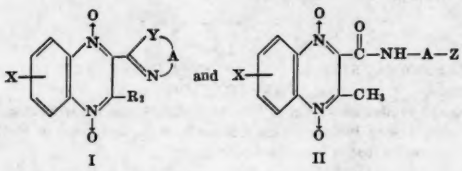
Marwan J. Abuel-Haj, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed March 18, 1970, Ser. No. 20,842

Int. Cl. C07d *51/78, 87/14, 85/36*

U.S. Cl. 260—244 R **6 Claims**

The 2-heterocyclic- and 2-[N-(ω-haloalkyl)carbamyl]substituted quinoxaline-1,4-dioxides having formulas I and II, respectively:



I and II

wherein X is a 6- or a 7-position substituent and is hydrogen, chloro, bromo, fluoro, methyl, methoxy and trifluoromethyl;

Y is O, S and NR_1 wherein

R_1 is hydrogen and lower alkyl;

A is alkylene of from two to five carbon atoms which places at least two carbon atoms between the N and Y or Z atoms to which it is attached;

R_2 is lower alkyl;

Z is chloro and bromo;

the non-toxic acid addition salts of those compounds wherein Y is $-NR_1$; and methods for their preparation are described. All compounds of formulas I and II are useful as antibacterial agents and many of them are effective animal growth promotants. Compounds of formula II are valuable intermediates for further synthesis.

3,671,522

PRODUCTION OF 2-CARBAMYLTETRAHYDROPYRIMIDINES

Helmut Hagen, Ludwigshafen, and Friedrich Becke, Heidelberg, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 17, 1970, Ser. No. 47,149

Claims priority, application Germany, June 28, 1969, P 19 32 833.7

Int. Cl. C07d *87/40*

U.S. Cl. 260—247.5 R **9 Claims**

Production of 2-carbamyltetrahydropyrimidines by reaction of haloacetamides with 1,3-alkylenediamines and elementary sulfur, and the new 2-carbamyltetrahydropyrimidines. The products are auxiliaries for the textile and leather industries, plant protection agents and starting materials for the production of textile auxiliaries, leather auxiliaries and plant protection agents.

3,671,523

HERBICIDAL AGENTS

Kurt Westphal, Wuppertal-Vohwinkel; Werner Meiser, Wuppertal-Elberfeld; Ludwig Fue, Cologne-Stammheim, and Helmuth Hack, Cologne-Buchheim, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 630,225, April 12, 1967. This application Jan. 28, 1970, Ser. No. 6,647

Claims priority, application Germany, April 16, 1966, F 48954

Int. Cl. C07d *55/10*

U.S. Cl. 260—248 AS **16 Claims**

3-[hydrogen-, (unsubstituted and halo, amino, alkylamino, nitro, alkyl, alkoxy, alkylmercapto, aryloxy and/or haloarylmercapto, -substituted) aliphatic-, cycloaliphatic-, araliphatic-, aryl-, or N-heterocyclic- or O-alkanoyl-, -substituted oxy, mercapto or amino]- 4-[amino; mono and di (unsubstituted and cyano, hydroxy and/or halo, -substituted) alkyl- and/or alkanoyl-, -amino; N- (unsubstituted and cycloalkyl, aryl, haloaryl, alkaryl, alkoxy aryl, nitroaryl, halo-nitro-aryl, arylalkenyl, heterocyclic and/or nitro- heterocyclic- -substituted) alkylidene-amino or cycloalkylidene- amino; or N-heterocyclic]-6-[(unsubstituted and halo, nitro, carbo lower alkoxy, alkyl, alkoxy, aryloxy, alkylmercapto, arylmercapto and/or aralkylmercapto, -substituted) aliphatic, cycloaliphatic, araliphatic, aryl, heterocyclic or heterocyclic- alkyl]-1,2,4-triazine-5-ones, which possess herbicidal properties, and which may be produced by conventional methods; herbicidal compositions containing such compounds; and methods of using such compounds as herbicides.

3,671,524

TRIAZINYL-COUMARINS

Kazuaki Suzuki, Kawanishi City, Japan, assignor to Showa Kagaku Kogyo Kabushiki Kaisha, Kawanishi City, Japan

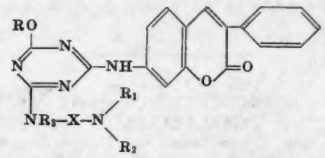
Filed Sept. 18, 1968, Ser. No. 760,667

Claims priority, application Japan, Sept. 20, 1967, 42/59827; Sept. 20, 1967, 42/59828; Nov. 4, 1967, 42/72808

Int. Cl. C07d *55/20*

U.S. Cl. 260—249.8 **1 Claim**

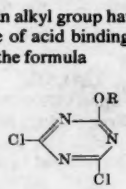
A process for preparing a fluorescent whitening agent of the formula



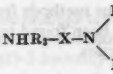
wherein R represents an alkyl group having one to four carbon atoms, each of R_1, R_2 and R_3 represents a hydrogen atom, or a lower alkyl group, and X represents a divalent organic residue such as lower alkylene group, hydroxy(lower)alkylene group or phenylene group, characterized by treating cyanuric chloride with an alcohol represented by the formula

ROH

wherein R represents an alkyl group having one to four carbon atoms, in the presence of acid binding agent to form a compound represented by the formula



wherein R is the same as defined above, and subsequently treating the compound with 3-phenyl-7-aminocoumarin and an amine represented by the formula



wherein R_1, R_2, R_3 and X are the same as defined above, in an optional order in an inert organic solvent or a mixed solution or dispersion of the inert organic solvent and water in the presence of acid binding agent.

3,671,525

PYRIDAZONIUM COMPOUNDS

Franz Reicheneder, and Rudolf Kropp, both of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed March 11, 1970, Ser. No. 18,692

Claims priority, application Germany, Mar. 15, 1969, P 19 13 265.1

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A **2 Claims**

The production of 2-alkylpyridazonium compounds by reaction of pyridazones-(6) with alkylating agents, and the new 2-alkylpyridazonium compounds. The compounds which can be prepared by the process according to the invention are pharmaceuticals and valuable starting materials for the production of dyes, pharmaceuticals and pesticides.

3,671,526

THIAZOLOPYRIMIDINES

Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 827,996, May 26, 1969, abandoned, which is a continuation-in-part of Ser. No. 741,856, July 2, 1968, abandoned, which is a continuation-in-part of Ser. No. 680,307, Nov. 3, 1967, abandoned. This application May 25, 1970, Ser. No. 40,367

Int. Cl. C07d *51/46*

U.S. Cl. 260—251 A **18 Claims**

Substituted thiazolopyrimidines, e.g., 3-p-chlorophenyl-6,7-dihydro-5H-thiazolo[3,2-a]pyrimidine hydrochloride, are prepared from phenacyl halides and propylene thiourea and are useful as CNS stimulants and analgesics.

3,671,527

DIALKYLAMINOALKYL ESTERS OF ADAMANTANETHIOCARBOXYLIC ACIDS

Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 644,099, June 7, 1967, Pat. No. 3,565,942, which is a continuation-in-part of Ser. No. 466,812, June 24, 1965, abandoned. This application July 6, 1970, Ser. No. 52,703

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PC **4 Claims**

The present dialkylaminoalkyl and related esters of adamantanethiocarboxylic acids possess anti-inflammatory activity and activity against a variety of organisms. Thus, they are anti-bacterial, anti-protozoal, anti-fungal, and anti-algal agents. The compounds are prepared by the reaction of an adamantanecarboxylic acid halide with an appropriate dialkylaminoalkanethiol or similar compounds.

3,671,528

5-PHENYL-1,2,4-BENZOTHIADIAZEPINE-1,1-DIOXIDES

John B. Wright, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 23, 1967, Ser. No. 648,226

Int. Cl. C07d *99/00*

U.S. Cl. 260—268 BC **4 Claims**

1,2,4-Benzothiadiazepine-1,1-dioxide derivatives are disclosed. These compounds can be prepared by condensation of a 2-benzoylbenzenesulfonyl chloride with guanidine, amidine, or with 2-alkylisothiourea, followed by cyclization of the obtained condensation product, and, optionally, by subsequent hydrogenation. These compounds are useful as intermediates for mothproofing agents, herbicides, and pickling inhibitors.

3,671,529

BASIC ANTHRAQUINONE DYES, WITH PYRIDINIUM 2- OR 4-DIMETHYLENE GROUP

Rudolf Altermatt, Tecknau, Basel-land; Roland Entschel, Basel, and Curt Mueller, Binningen, Basel-land, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 481,404, Aug. 20, 1965, Pat. No. 3,518,247. This application Aug. 20, 1969, Ser. No. 851,743

Int. Cl. C07d *31/48*

U.S. Cl. 260—294.8 B **13 Claims**

Basic anthraquinone dyes free from sulphonic acid groups produced with a vinylpyridine group which are highly suitable for dyeing and printing acrylonitrile polymers or copolymers.

3,671,530

CERTAIN SUBSTITUTED 1,3-BISDILOWER-ALKYLAMINOETHOXY-INDANS

John William Van Dyke, Jr., Elkhart, and Margaret Jo Van Laecke, Osceola, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 27, 1970, Ser. No. 67,637

Int. Cl. C07c *93/06*; C07d *31/42*

U.S. Cl. 260—295 F **5 Claims**

Certain diaminoalkyl ethers of substituted 1,3-indandiols and a method for their preparation are disclosed. These compounds are useful as antihistaminics.

3,671,531

BENZOTHIAZOLINYLIDENE SUBSTITUTED UREAS

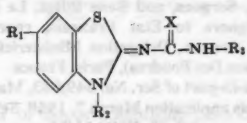
William D. Dixon, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 10, 1970, Ser. No. 97,054

Int. Cl. C07d *91/24*

U.S. Cl. 260—305 **15 Claims**

Novel ureas and thioureas of the formula



where X is oxygen or sulfur, R_1 and R_2 are alkyl radicals of not more than four carbon atoms, R_3 is alkyl of not more than 12 carbon atoms, alkenyl of not more than 12 carbon atoms, cycloalkenyl of six through eight carbon atoms, haloalkyl of not more than 12 carbon atoms and with not more than three halogen atoms therein on the one and two carbon atoms, halophenyl of not more than five halogen atoms, haloalkylphenyl of not more than three haloalkyls having not more than four carbon atoms and not more than three halogen atoms therein, with the provision that the double bond in said alkenyl and cycloalkenyl are not in the 1-position.

These compounds are useful as herbicides.

3,671,532

COMPOSITION AND METHOD FOR LOWERING THE BLOOD SUGAR CONTENT OF DIABETIC MAMMALS

Gilbert L. Carraz, St. Jean de Moirans, and Andre Boucherle, Grenoble, both of France, assignors to Societe De Recherches Industrielles S.O.R.d., Dijon, France

Filed March 6, 1967, Ser. No. 620,631

Claims priority, application France, Aug. 5, 1966, 838; Dec. 29, 1966, 844

Int. Cl. A61k *27/00*

U.S. Cl. 424—305 **3 Claims**

The invention relates to a method of lowering the blood sugar content in mammals by exploiting the hypoglycemic ac-

tivity of certain pentacyclic triterpene derivatives such as mixtures of glycyrrhetinic acids and their esters, to treat obese diabetic subjects.

3,671,533

2,3,5,6-TETRAHYDROIMIDAZO[2,1-B]THIAZOLES

William J. Houlihan, and Robert E. Manning, both of Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 790,449, Jan. 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 748,929, July 31, 1968, abandoned. This application Jan. 26, 1970, Ser. No. 5,894

Int. Cl. C07d *99/06*

U.S. Cl. 260—306.7 **10 Claims**

Substituted imidazo thiazoles, e.g., 3-(4′-chlorophenyl)-2-ethyl-3-hydroxy-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole are prepared from 2-haloalkylphenones and 2-imidazolinethione and are useful as anorexics and anti-depressants.

3,671,534

6,6-DI-LOWER ALKYL-2,3,5,6-TETRAHYDROIMIDAZO [2,1-B] THIAZOLES

William J. Houlihan, and Robert E. Manning, both of Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Filed March 16, 1970, Ser. No. 20,071

Int. Cl. C07d *99/06*

U.S. Cl. 260—306.7 **2 Claims**

Substituted imidazo thiazoles, e.g., 3-(4′-chlorophenyl)-6,6-dimethyl-2-ethyl-3-hydroxy-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole are prepared from 2-haloalkylphenones and 4,4-di-lower alkyl-2-imidazolinethione and are useful as diuretics.

3,671,535

4-IMINO-OXAZOLIDIN-2-ONES AND PROCESS OF PREPARATION

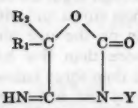
Michel Faidutti, Saint-Auban; Jacques Bolleau, Paris; Jean-Paul Konrat, Sorgues, and Rene Billaz, Le Bouchet, all of France, assignors to Etat Francais, represente par le Ministre des Armees, Delegation Ministerielle pour l'Arement (Direction Des Poudres), Paris, France

Continuation-in-part of Ser. No. 349,943, March 6, 1964, abandoned. This application March 7, 1968, Ser. No. 711,384

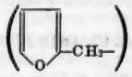
Int. Cl. C07d *85/28*

U.S. Cl. 260—307 C **14 Claims**

The present invention relates to 4-imino-oxazolidin-2-ones corresponding to the following formula:



wherein Y represents an alkyl of from one to 18 carbon atoms such as methyl, ethyl, isopropyl, hexyl, octadecyl; cycloalkyl such as cyclohexyl; an aralkyl such as benzyl; an aryl such as phenyl and naphthyl; a substituted aryl such as tolyl, o-, m- and p-chloro-phenyl, methoxy phenyl, nitrophenyl; heterocyclic group such as furyl; and wherein R_1 and R_2 each represent hydrogen; a straight or branched unsubstituted alkyl of from one to eight carbon atoms such as methyl, propyl, isopropyl, butyl, tert-butyl and heptyl; aryl such as phenyl; heterocyclic group such as furyl derivatives



or R_1 and R_2 may represent the necessary groups which when joined form a ring with the carbon atom of the main oxazolidin-2-one ring such as a cyclohexane ring. The invention is also directed to various methods for preparing the subject compounds which have been found to possess valuable plant growth regulating properties.

3,671,536

ANTHRAQUINONE DYES

Manfred Patsch, Ludwigshafen, and Heinz Ellingsfeld, Frankenthal, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed March 17, 1970, Ser. No. 20,405

Claims priority, application Germany, March 20, 1969, P 19 14 207.5; Sept. 30, 1969, P 19 49 295.6

Int. Cl. C07d *85/52*

U.S. Cl. 260—307.5 **5 Claims**

1,4-diaminoanthraquinones bearing in position 2 a 1,2,4-oxadiazole group which is substituted in position 3 by an aromatic or aliphatic radical. These anthraquinone derivatives are valuable blue disperse dyes for use in dyeing and printing synthetic textile materials.

3,671,537

CERTAIN 3-(2,6-DICHLOROPHENYL)-2-IMINOTHIAZOLIDINES

Lajos Toldy; Jozsef Borsi; Sandor Elek; Istvan Elekes, and Ferenc Andrasi, all of Budapest, Hungary, assignors to Gyogyszerkutato Intezet, Budapest, Hungary

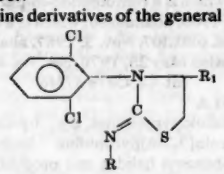
Filed June 1, 1970, Ser. No. 42,462

Claims priority, application Hungary, June 5, 1969, GO-1096

Int. Cl. C07d *91/18*

U.S. Cl. 260—306.7 **3 Claims**

New thiazolidine derivatives of the general formula I



(I)

wherein R is an alkyl-group having from one to five carbon atoms, and R_1 is hydrogen, methyl, ethyl and hydroxymethyl groups, and their acid addition salts formed with non-toxic acids. The compounds show a special effect on the central nervous system.

3,671,538

POTASSIUM 4-METHYL-1,2,4-OXADIAZOLIDINE-3,5-DIONE AND SODIUM 4-METHYL-1,2,4-OXADIAZOLIDINE-3,5-DIONE

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 853,945, Aug. 28, 1969, Pat. No. 3,590,054. This application Aug. 14, 1970, Ser. No. 63,945

Int. Cl. C07d *85/52*

U.S. Cl. 260—307 B **3 Claims**

This invention discloses the compound 2-(2,4-dichlorophenoxyacetyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione and its use as a herbicide. Further disclosed are the compounds potassium 4-methyl-1,2,4-oxadiazolidine-3,5-dione and sodium 4-methyl-1,2,4-oxadiazolidine-3,5-dione.

3,671,539

PREPARATION OF AMINO-ETHYL ISOXAZOLYL SUBSTITUTED TETRAHYDROPYRANS AND INTERMEDIATES THEREFOR

Gabriel Saucy, Essex Fells, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Jan. 19, 1970, Ser. No. 4,026

Int. Cl. C07d *85/22*

U.S. Cl. 260—307 H **12 Claims**

Alternate process routes to 2-(substituted amino)-6-(2-[3,5-dimethyl-4-isoxazolyl]ethyl)-tetrahydropyran-2-ols and

their optionally alkylated analogs are described. The preparative routes involve multi-step procedures starting from 2-(2'-substituted aminoethyl)-2-hydroxy-6-vinyl-tetrahydropyrans and their alkyl substituted analogs including a last step isomerization and amine addition to a 1-(3,5-disubstituted-4-isoxazolyl)-7-hydroxy-non-8-en-3-one or its tautomer. The final product aminoethyl-isoxazolyl substituted tetrahydropyrans are intermediates useful in the preparation of pharmaceutically valuable steroidal compounds. In preferred embodiments the amino substituent group in the final products is an optically active amine which renders such products particularly suitable, via resolution procedures, to serve as intermediates in the preparation of optically active steroidal compounds.

3,671,540
SUBSTITUTED HYDANTOINS

Albrecht Zschocke, 5 Berliner Strasse, 6702, Bad Duerkheim; Wolfgang Rohr, 19 Hebelstrasse, 6800, Mannheim, and Adolf Fischer, 43 Speyerer Strasse 6704, Mutterstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

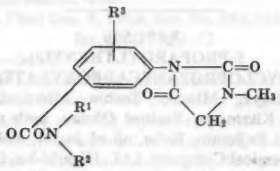
Filed March 13, 1970, Ser. No. 19,470

Claims priority, application Germany, March 18, 1969, P 19 13 631.3

Int. Cl. C07d 49/32

U.S. Cl. 260—309.5 **5 Claims**

Valuable hydantoins having the formula



where R^1 denotes hydrogen or a lower alkyl group, R^2 denotes a saturated or unsaturated aliphatic radical which may be substituted by halogen, hydroxyl, alkoxy, cyano or alkylmercapto, and R^3 denotes hydrogen or the methyl group, and a process for controlling the growth of unwanted plants with these compounds.

3,671,541
1,2,2A,3,4,5-HEXAHYDRO-1-(2-IMIDAZOLIN-2-YLMETHYL)BENZ[CDINDOLES

Gerhard Bormann, Basel; John Gmunder, Muttenz, both of Switzerland, and Heinrich Wilkens, Brombach, Germany, assignors to Sandoz Ltd. (a/k/a Sandoz AG), Basle, Switzerland

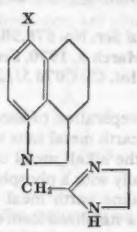
Filed Aug. 19, 1970, Ser. No. 65,281

Claims priority, application Switzerland, Aug. 27, 1969, 12967/69; March 31, 1970, 4703/70; April 6, 1970, 5039/70

Int. Cl. C07d 49/34

U.S. Cl. 260—309.6 **4 Claims**

The invention concerns compounds of the formula:



wherein X is hydrogen, halogen or methyl.

The compounds are useful peripheral and systemic vasoconstrictors.

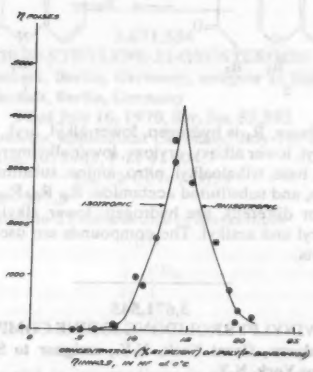
3,671,542
OPTICALLY ANISOTROPIC AROMATIC POLYAMIDE DOPES

Stephanie Louise Kwolek, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 736,410, June 12, 1968, abandoned, which is a continuation-in-part of Ser. No. 644,851, June 9, 1967, abandoned, which is a continuation-in-part of Ser. No. 556,934, June 13, 1966, abandoned. This application May 23, 1969, Ser. No. 827,345. The portion of the term of this patent subsequent to June 20, 1999, has been disclaimed.

Int. Cl. C08g 51/44, 51/46, 51/50

U.S. Cl. 260—30.8 R **2 Claims**



Compositions or dopes comprising carbocyclic aromatic polyamides in suitable liquid media are prepared which are optically anisotropic (exhibit different light transmission properties in different directions in the dope). These dopes, and related isotropic dopes, are used in preparing fibers of unique internal structure (evidenced by low orientation angle and/or high sonic velocity) and exceptionally high tensile properties (e.g., initial modulus).

3,671,543
IMIDOMETHYL DERIVATIVES OF 1,3,3-TRIMETHYLINDOLINO-SPIROPYRAN

Koichi Koga, Toyonaka; Minoru Hatori, Takarazuka, and Takashi Akamatsu, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan

Filed May 28, 1970, Ser. No. 41,584

Int. Cl. C07d 27/38

U.S. Cl. 260—326 D **11 Claims**

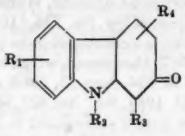
Novel imidomethyl or amidomethyl derivatives of 1,3,3-trimethylindolino-spiropyran are produced by reacting a 1,3,3-trimethylindolino-spiropyran derivative with an imidomethylating or amidomethylating agent in the presence of a condensing agent and optionally in a solvent. These novel compounds are adapted to be used as a coloring matter for pressure sensitive copy papers and particularly as one component of a coloring matter for black pressure sensitive copy papers.

3,671,544
3,4,4A,9A-TETRAHYDRO-2-(1H)CARBAZOLONES

Robert I. Meltzer, Rockaway, and Raymond R. Wittekind, Morristown, both of N.J., assignors to Warner-Lambert Company

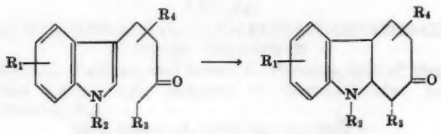
Filed July 13, 1970, Ser. No. 54,602
Int. Cl. C07d 27/68
U.S. Cl. 260—315 5 Claims

The present invention discloses a new class of carbazolones having the following structural formula:



1

These compounds are prepared in accordance with the following reaction scheme:



2 1

In the above, R_1 is hydrogen, lower alkyl, aryl, substituted aryl, aralkyl, lower alkoxy, aryloxy, lower alkylmercapto, arylmercapto, halo, trihaloalkyl, nitro, amino, substituted amino, acetamido, and substituted acetamido. R_2, R_3, R_4, which can be alike or different, are hydrogen, lower alkyl, aryl, substituted aryl and aralkyl. The compounds are useful as analgesic agents.

3,671,545
POLYVINYLPYRROLIDONE-IODINE COMPOUNDS

Alfred Halpern, Great Neck, N.Y., assignor to Synergistics, Inc., New York, N.Y.

Filed May 5, 1969, Ser. No. 822,008
Int. Cl. C07d 27/08
U.S. Cl. 260—326.5 FL 11 Claims

Hydrogen-bonded complexed compounds formed from an iodophor and a polyhydroxylated compound containing at least two hydroxyl groups which are useful in the preparation of iodophor-containing, abrasive, detergent compositions comprising said hydrogen-bonded complexed compound, a detergent, an abrasive substance and a pharmaceutically acceptable carrier therefor, said compositions being suitable to the abrasive germicidal cleansing of the skin and in the treatment of acne.

3,671,546
FLUORINATED ALIPHATIC ACIDS AS PROCESSING AIDS FOR SILICONE RUBBER COMPOSITIONS

Bruce D. Karstedt, Charlotte, N.C., and John S. Razzano, Troy, N.Y., assignors to General Electric Company

Filed Oct. 1, 1970, Ser. No. 77,369
Int. Cl. C08g 51/04
U.S. Cl. 260—37 SB 14 Claims

A silicone rubber composition of improved processing characteristics including (a) a polydiorganosiloxane having the formula,

$$(R)_nSiO_{\frac{4-n}{2}}$$

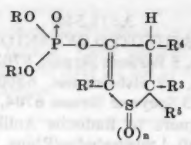
(b) a structure defining inorganic filler, (c) a process aid and (d) a fluorine-substituted hydrocarbon acid where R is a monovalent hydrocarbon radical and n has a value of from 1.98 to 2.01 inclusive. The above composition is used with a peroxide curing agent at elevated temperatures to produce a cured silicone rubber.

3,671,547
DIALKYL DIHYDROTHIENYL PHOSPHATES

Lawrence E. Stevick, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 15, 1969, Ser. No. 885,291
Int. Cl. C07d 63/08
U.S. Cl. 260—329 P 7 Claims

Compound of the formula:



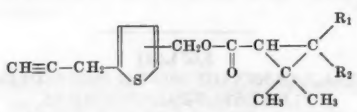
wherein R and R^1 and alkyl of 1 to 4 carbon atoms, R^2 is hydrogen, halogen of atomic number 17 to 35 or alkyl of one to three carbon atoms and R^3, R^4 and R^5 are hydrogen or alkyl or one to three carbon atoms and n is 0, 1 or 2. These phosphates are insecticidal.

3,671,548
5-PROPARGYLTHENYL CYCLOPROPANECARBOXYLATES

Nobushige Itaya, Minuo; Toshio Mizutani, Hirakata; Shigeyoshi Kitamura; Yositosi Okuno, both of Toyonaka, and Keimei Fujimoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan

Filed March 26, 1970, Ser. No. 23,018
Claims priority, application Japan, April 4, 1969, 44/26433; April 11, 1969, 44/28586
Int. Cl. C07d 63/12
U.S. Cl. 260—332.2 R 7 Claims

A thiophene derivative having the formula,



wherein R_1 is hydrogen or methyl, and R_2 is methyl, 2-methyl-1-propenyl or 2-methoxycarbonyl-1-propenyl when R_1 is hydrogen, and R_2 is methyl when R_1 is methyl, which may be used as insecticides with high insecticidal activities.

3,671,549
PROCESS FOR PREPARING ASCORBYL-3-PHOSPHATE AND SALTS THEREOF

David F. Hinkley, Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 578,983, Sept. 13, 1966. This application March 5, 1970, Ser. No. 16,940
Int. Cl. C07d 5/12
U.S. Cl. 260—343.7 6 Claims

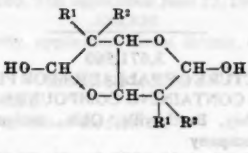
A process for the preparation of ascorbyl-2-phosphate and the alkali or alkaline earth metal salts which comprises reacting ascorbic acid or the alkali metal or alkaline earth metal salts thereof sequentially with a phosphorylating agent, water, and an alkali or alkaline earth meal base. The ascorbyl-2-phosphate is useful as a stabilized form of Vitamin C.

3,671,550
HEXAHYDRO-3,3,6,6-TETRA ALKYLFURO(3,2-B)FURAN-2,5-DIOL

Hugh J. Hagemeyer, Jr., and Alfred G. Robinson, III, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 10, 1970, Ser. No. 45,218
Int. Cl. C07d 5/04
U.S. Cl. 260—347.8 6 Claims

Novel bicyclic furofuran-diols having the structure:



wherein R^1 and R^2 are the same or different, and each of R^1 and R^2 are alkyl groups of one to 10 carbons, have been discovered. The compounds are valuable intermediates, for the preparation of polyols, dilactones, simple esters and polyesters.

3,671,551
MYRCENE EPOXIDE DIELS-ALDER ADDUCTS

James O. Bledsoe, Jr., Jacksonville, Fla., assignor to SCM Corporation, Cleveland, Ohio

Filed Dec. 8, 1969, Ser. No. 883,266
Int. Cl. C07d 1/12
U.S. Cl. 260—348 R 4 Claims

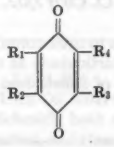
Diels-Alder adducts of myrcene epoxide have been found to exhibit excellent olfactory and perfumery properties. The adducts are made by reacting myrcene epoxide with an $\alpha\beta$-unsaturated carbonyl compound (dienophile), such as acrolein, in a Diels-Alder reaction. Additionally the adducts can be hydrogenated to form the saturated adduct which also possesses excellent olfactory properties.

3,671,552
PROCESS FOR THE PREPARATION OF QUINONES AND HYDROQUINONES

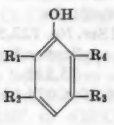
Louis Le Bris; Daniel Michelet, and Michel Rakoutz, all of Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed July 2, 1970, Ser. No. 52,071
Claims priority, application France, July 4, 1969, 6922816
Int. Cl. C07c 49/64, 49/66, 49/68
U.S. Cl. 260—369 13 Claims

Quinones of the formula:



in which the symbols R_1, R_2, R_3 and R_4 represent hydrogen, halogen, or hydrocarbon radicals, not more than three of the symbols representing hydrogen, are obtained by oxidation of a phenol of the formula:



in the presence of thallic cations in an aqueous acid medium optionally containing an inert organic solvent.

3,671,553
PROCESS FOR THE PREPARATION OF VERY PURE MONOSULFONIC ACIDS OF TRIPHENYL-METHANE DYESTUFFS

Theodor Papenfuss, Niederhofheim/Taunus, and Ernst Spietschka, Oberauroff, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning, Frankfurt/Main, Germany

Filed April 13, 1970, Ser. No. 28,153
Claims priority, application Germany, April 18, 1969, P 19 19 724.1
Int. Cl. C09b 11/12
U.S. Cl. 260—392 14 Claims

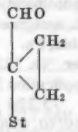
Process for the preparation of very pure monosulfonic acids of triphenyl-methane dyestuffs by treating a solution of the appropriate color base with aqueous sulfuric acid, filtering the suspension obtained, treating the filter residue with an inert less polar organic solvent which is not miscible with water, and isolating the color base sulfate or diluting the solution of the color base with an inert less polar organic solvent that is not miscible with water, and then treating it with dilute sulfuric acid, filtering the suspension obtained, treating the filter residue consisting substantially of color base sulfate and amine sulfate, and isolating the color base sulfate.

3,671,554
20,20-ETHYLENE-21-OXOSTEROIDS

Rudolf Wiechert, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin, Germany

Filed July 16, 1970, Ser. No. 55,592
Claims priority, application Germany, July 16, 1969, P 19 37 062.8; Aug. 13, 1969, P 19 41 604.7
Int. Cl. C07c 169/34
U.S. Cl. 260—397.3 29 Claims

20.20-Ethylene-21-oxosteroids of the formula



which are useful as intermediates in the production of cardioactive steroids having a lactone at the 17-position, are produced by reacting a 20-keto-21-sulfonyloxy steroid with dimethyl-sulfoxonium methylide.

3,671,555
TRIALKYLSYLILOXY-STEROID COMPOUNDS AND PROCESS FOR MAKING SAME

Gerhard Teichmuller; Kurt Barnikol-Oettler, and Werner Hartmann, all of Jena, Germany, assignors to VEB Jenapharm, Jena, Germany

Filed March 5, 1969, Ser. No. 804,662
Int. Cl. C07c 169/08, 169/20
U.S. Cl. 260—397.4 21 Claims

Trialkylsilyloxyether-substituted steroid compounds. The compounds are made from steroids which include phenolic hydroxyl groups by dissolving the steroid compound in a dipolar aprotic solvent and reacting it with hexamethyldisilazane, or a mixture of this compound with trimethylchlorosilane, followed by recovery of the trimethylsilyloxyether.

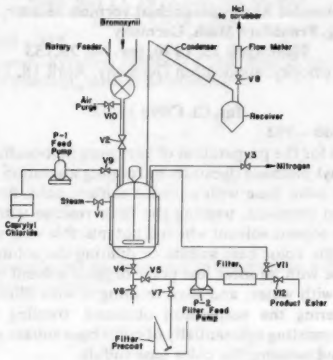
3,671,556
MANUFACTURING PROCESS FOR ESTERS OF DIHALO-HYDROXYBENZONITRILES

Robert Jay Goldstick, Philadelphia, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Nov. 21, 1969, Ser. No. 878,724
Int. Cl. C09f 7/00, 7/10
U.S. Cl. 260—404 4 Claims

Aliphatic, cycloaliphatic or aromatic esters of 3,5-dihalo-4-hydroxybenzonitrile are prepared by gradually adding the

solid benzonitrile derivative to a slight molar excess of the corresponding acid chloride kept at temperatures above 120° C



and venting the liberated hydrogen chloride through an alkaline scrubber.

3,671,557

1,2-DIACYLGLYCEROL 3-(2,2,2-TRICHLOROETHYL) CARBONATES

Francis R. Pfeiffer, Cinnaminson, and Jerry A. Weisbach, Cherry Hill, both of N.J., assignors to Smith, Kline & French Laboratories, Philadelphia, Pa.

Continuation-in-part of Ser. No. 722,538, April 19, 1968, Pat. No. 3,558,656. This application Sept. 17, 1970, Ser. No. 73,224

Int. Cl. C07c *69/30, 69/00;* **C07d** *13/04*

U.S. Cl. 260—408 **4 Claims**

1,2 and 2,3-Diacylglycerols are prepared from sn-glycerol 1,2-acetonide via the intermediate sn-glycerol 1,2-acetonide 3-(2,2,2-trichloroethyl) carbonate, which, after hydolysis with acid to the 1,2-diol derivative rearranges stereospecifically in pyridine or thermally to give sn-glycerol 2,3-carbonate.

3,671,558

NOVEL ESTERS AND DERIVATIVES

John B. Siddall, Palo Alto, Calif., and Jeans Pierre Calame, Locarno, Switzerland, assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 800,266, Feb. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 618,351, Feb. 24, 1967, abandoned, which is a continuation-in-part of Ser. Nos. 579,490, Sept. 15, 1966, abandoned, and Ser. No. 590,195, Oct. 28, 1966, abandoned, and Ser. No. 592,324, Nov. 7, 1966, abandoned, and Ser. No. 594,664, Nov. 16, 1966, abandoned, and Ser. No. 605,566, Dec. 29, 1966, abandoned, and Ser. No. 605,578, Dec. 29, 1966, abandoned. This application July 22, 1969, Ser. No. 843,818

Int. Cl. C07c *69/74, 61/16;* **A01n** *9/24*

U.S. Cl. 260—410.9 R **13 Claims**

Novel aliphatic hydrocarbon esters, acids and alcohols having a backbone of at least 12 carbon atoms, a lower alkyl group at C-3, C-7 and C-11 and unsaturation or saturation at C-2,3, C-6,7 and/or C-10,11 which are substituents with, for example, halo, hydroxy, methylene, oxido, dihalo-methylene, and the like, and the esters and ethers of said hydroxy substituent useful as arthropod maturation inhibitors.

3,671,559

PROCESS FOR CARBONYLATING ALKANOLS

Arien Kwantes, and Bernhard Stouthamer, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed July 9, 1969, Ser. No. 840,196

Claims priority, application Great Britain, Nov. 15, 1968, 54,331/68

Int. Cl. C07c *51/12*

U.S. Cl. 260—413 **4 Claims**

Controlled addition of olefins to alcohol carbonylation zone to prevent water build-up and sustain acidic liquid catalyst activity.

3,671,560

MANUFACTURE OF PALLADIUM OR PLATINUM-CONTAINING COMPOUNDS

Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 29, 1970, Ser. No. 76,607

Int. Cl. C07f *15/00*

U.S. Cl. 260—429 R **9 Claims**

Compounds of the formula $M(Z_3P)_4$, where M is palladium or platinum and Z is a hydrocarbon or substituted hydrocarbon radical, are produced by reacting the metal in elemental form with a corresponding Z_3P compound. One specific example is the production of tetrakis(triphenylphosphine)palladium(O) by reacting elemental palladium with triphenylphosphine.

3,671,561

METHOD OF MAKING HEXAORGANODIPLUMBANES

Max Buschhoff, Luenen, Germany, assignor to Schering AG, Berlin, Germany

Filed Dec. 31, 1969, Ser. No. 889,708

Claims priority, application Germany, Jan. 7, 1969, P 19 01 030.1

Int. Cl. C07f *7/24*

U.S. Cl. 260—437 R **7 Claims**

Method of making hexaorganodiplumbanes, Pb_2R_6, by reacting a lead carboxylate and an organoaluminum compound, AlR_3, where R is aliphatic or cycloaliphatic.

3,671,562

UREA SILICON PRODUCT AND THE PREPARATION THEREOF

Enrico J. Pepe, and James G. Marsden, both of Amawalk, N.Y., assignors to Union Carbide Corporation

Continuation-in-part of Ser. No. 729,895, May 17, 1968, abandoned. This application Sept. 12, 1968, Ser. No. 759,524

Int. Cl. C07f *7/02, 7/04*

U.S. Cl. 260—448.8 R **10 Claims**

This invention relates to urea containing silicon compounds and the uses thereof, particularly as coupling agents on glass and to the similar use of substituted urea containing silicon compounds.

3,671,563

GLYCEROL 3-(2,2,2-TRICHLOROETHYL) CARBONATE

Francis R. Pfeiffer, Cinnaminson, and Jerry A. Weisbach, Cherry Hill, both of N.J., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Continuation-in-part of Ser. No. 722,538, April 19, 1968, Pat. No. 3,558,656. This application Sept. 17, 1970, Ser. No. 73,225

Int. Cl. C07c *69/00;* **C07d** *13/04;* **C07c** *69/30*

U.S. Cl. 260—463 **1 Claim**

1,2 and 2,3-Diacylglycerols are prepared from sn-glycerol 1,2-acetonide via the intermediate sn-glycerol 1,2-acetonide

3-(2,2,2-trichloroethyl) carbonate, which, after hydrolysis with acid to the 1,2-diol derivative rearranges stereospecifically in pyridine or thermally to give sn-glycerol 2,3-carbonate.

3,671,564

BENZYLIDENE CYANO-ACETALS

Ronald Morton Cresswell, Scarsdale, and John William Mentha, Hartsdale, both of N.Y., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

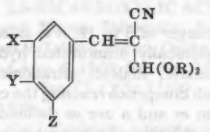
Continuation-in-part of Ser. No. 587,392, Oct. 18, 1966, Pat. No. 3,573,185. This application June 12, 1969, Ser. No. 832,830

Claims priority, application Great Britain, Oct. 28, 1965, 45,657/65

Int. Cl. C07c *121/74*

U.S. Cl. 260—465 F 8 Claims

Unsaturated acetals of the formula



where X, Y and Z are hydrogen, halogen or lower alkoxy and R is lower alkyl. The unsaturated acetals are useful as intermediate to prepare the corresponding saturated acetals which may then be reacted with guanidine to produce the corresponding 2,4-diamino-5-benzyl pyrimidines which are useful as antibacterials.

3,671,565

PROCESS FOR HYDROGENATING ACRYLONITRILE TO PROPIONITRILE

Jin Sun Yoo, South Holland, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Jan. 16, 1970, Ser. No. 3,519

Int. Cl. C07c *121/16*

U.S. Cl. 260—465.1 10 Claims

The hydrogenation of acrylonitrile to propionitrile is disclosed using a catalyst having a complex of (A) nickel, and (B) an organometallic reducing agent on (C) an acidic, silica-based support material. The complex has a molar ratio of (B) to (A) of about 2:1 to 50:1 or more, preferably about 3:1 to 20:1, and with (A) being a minor catalytic amount, e.g. from about 0.1 to 5 weight percent, based on the support. Preferred catalyst components include nickel acetylacetonate and diisobutylaluminum hydride on a solid, acidic silica-based support.

3,671,566

MANUFACTURE OF ADIPONITRILE

Martin Decker; Joseph Schmidt, both of Ludwigshafen; Herwig Hoffmann, Frankenthal, and Hans Joachim Pistor, Walldorf, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

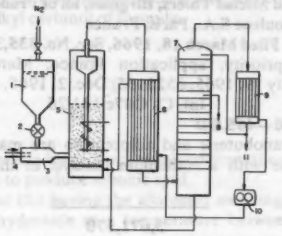
Filed March 30, 1970, Ser. No. 23,675

Claims priority, application Germany, April 1, 1969, P 19 16 601.9

Int. Cl. C07c *121/10*

U.S. Cl. 260—465.2 3 Claims

Production of adiponitrile by introducing adipic acid in solid powder form or in liquid form and simultaneously introducing ammonia into a fluidized bed of a usual catalyst at a temperature of from 250° to 420°C and recovering the adiponitrile from the reaction gases by fractional distillation wherein there is added to the reaction gas before entry into the distillation column sufficient water to make the molar ratio of water vapor to ammonia 0.8 to 1.5 in the mixture entering the column. Adiponitrile is an intermediate in the manufacture of synthetic fibers of, for example, nylon 6.6.



3,671,567

PRODUCTION OF ADIPONITRILE

Olav Torgeir Onsager, Waldwick, N.J., assignor to Halcon International, Inc.

Filed April 29, 1970, Ser. No. 33,042

Int. Cl. C07c *121/26*

U.S. Cl. 260—465.8 D 8 Claims

The invention relates to the reductive coupling of organic halo compounds, especially organic halo nitriles, using a coupling composition comprising a metal and a salt of the same metal. The invention is especially concerned with recovery and reuse of the coupling composition.

3,671,568

PRODUCTION OF ADIPONITRILE

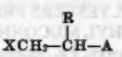
Olav Torgeir Onsager, Waldwick, N.J., assignor to Halcon International, Inc.

Filed April 29, 1970, Ser. No. 33,043

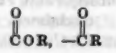
Int. Cl. C07c *121/26*

U.S. Cl. 260—465.8 D 4 Claims

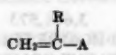
A process for the reductive coupling of a compound having the formula



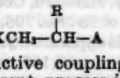
wherein X is Cl, Br, or I, R is H or lower alkyl, and A is —CN,



or —$CONR_2$, using as reducing agent a metal or a lower valent compound thereof in combination with a promoter salt. The invention especially relates to an overall process for the production of linear dimers of compounds of the formula



by first hydrohalogenation to



followed by the reductive coupling. The specific improvement of the present process is the provision of a nitrile solvent during the reductive coupling whereby improved coupling selectivities are achieved.

3,671,569
PROCESS FOR THE PREPARATION OF ALIPHATIC DINITRILES

Pierre Chabardes; Pierre Gandilhon; Charles Grard, all of Lyon, and Michel Thiers, Birgnais, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed March 18, 1966, Ser. No. 535,322

Claims priority, application France, March 18, 1965, 659738; July 19, 1965, 6525155; Dec. 2, 1965, 6540725

Int. Cl. C07c *121/26*

U.S. Cl. 260—465.8 D 5 Claims

1,4-Dicyanobutene and adiponitrile are made by heating acrylonitrile with a ruthenium catalyst in the presence of hydrogen.

3,671,570
DERIVATIVES OF 9-OXO-15-HYDROXYPROSTANOIC ACID, HOMOLOGS THEREOF AND THEIR PREPARATION

Jehan F. Bagli, Valois Gardens, and Tibor Bogri, Montreal, Quebec, both of Canada, assignors to Ayerst McKenna and Harrison Limited, Ville St. Laurent, Quebec, Canada

Filed July 30, 1970, Ser. No. 59,702

Int. Cl. C07c *61/36, 65/20*

U.S. Cl. 260—468 R 5 Claims

There are disclosed herein derivatives of 9-oxo-15-hydroxy prostanoic acid, lower alkyl esters thereof, and homologs thereof, as well as a process for preparing the above acids, lower alkyl esters thereof, and homologs thereof. The compounds possess hypotensive, antihypertensive, bronchospasmolytic and gastric acid secretion inhibiting properties, as well as inhibiting the aggregation of platelets and promoting the disaggregation of aggregated platelets. Methods for their use are also disclosed.

3,671,571
BISCARBAMATES

Karl-Heinz Koenig, Ludwigshafen; Gustav Steinbrunn, Schwegenheim; Hermann Windel, Frankenthal, and Adolf Fischer, Mutterstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Continuation-in-part of Ser. No. 649,097, June 27, 1967, Pat. No. 3,551,477. This application July 17, 1970, Ser. No. 55,984

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C 3 Claims

Biscarbamates and their use for controlling undesirable plant growth.

3,671,572
UNSATURATED POLYESTERS PREPARED FROM α,α'-DIMETHYL MUCONIC ACIDS

Gary L. Driscoll, Boothwyn, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed March 10, 1969, Ser. No. 805,818. The portion of the term of this patent subsequent to Feb. 25, 1986, has been disclaimed.

Int. Cl. C07c *69/52*

U.S. Cl. 260—485 G 10 Claims

Normally liquid curable polyesters that are plasticizers which add ultraviolet stability to solid vinyl chloride polymers are prepared from α,α'-dimethyl muconic acids and derivatives thereof and polyethylene glycols.

3,671,573
SUBSTITUTED D-HOMOESTRA TETRAENE AND PENTAENE COMPOUNDS

Marinus Los, Edinburg, Scotland, assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 708,498, Feb. 27, 1968, Pat. No. 3,565,958. This application June 17, 1970, Ser. No. 47,165

Int. Cl. C07c *49/76, 69/14*

U.S. Cl. 260—488 CD 6 Claims

This invention relates to substituted D-homoestra tetraenes and pentaenes useful in the synthesis of other D-homosteroids. The latter steroids are useful as estrogenic agents in the treatment of laboratory and domestic animals.

3,671,574
PREPARATION OF POLYFLUOROALKYL ESTERS OF FUMARIC AND OTHER ACIDS

Martin Knell, Ossining, and Peter P. Klemchuk, Yorktown Heights, both of N.Y., assignors to Ciba-Geigy Corporation

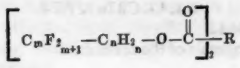
Filed Dec. 19, 1969, Ser. No. 886,723

Int. Cl. C07c *69/52, 69/60*

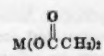
U.S. Cl. 260—485 F 12 Claims

0000

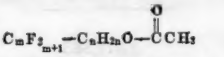
A process for the preparation of ester compounds of the formula:



wherein m is an integer of 3 to 18; n is an integer of 2 to 10; and R is an ethylenically unsaturated hydrocarbon radical derived from fumaric, maleic, citraconic, mesaconic, or itaconic acid, which comprises reacting the compound $C_mF_{2m+1}—C_nH_{2n}—X$ wherein m and n are as defined above, and X is iodine, bromine or chlorine with an acetate of the formula



wherein M is a metal selected from cadmium, lead, mercury, and zinc, to form a polyfluoroalkyl acetate of the formula



wherein m and n are as defined above, then reacting the polyfluoroalkyl acetate with fumaric, maleic, citraconic, mesaconic, or itaconic acid, or a diloweralkyl ester of said acid and recovering the ester from the reaction mixture. The esters prepared by the process of this invention form polymers which are useful in oil and water-repellent textile finishes.

3,671,575
PROCESS FOR PREPARING VITAMIN A ESTERS

Marcel Weinstock, Edgware, England, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 30, 1970, Ser. No. 93,817

Int. Cl. C07c *67/00*

U.S. Cl. 260—491 14 Claims

This invention is directed to a new and improved process for preparing vitamin A alcohol esters by treating 1-alkanoyloxy-6-hydroxy or alkanoyloxy-3, 7-dimethyl-9-[2,6,6-trimethyl-cyclohexen-1-yl]-nonatriene-(2,4,7), with a halogenated hydrocarbon dissolved in an inert organic solvent having a high dipole moment.

3,671,576
PROCESS FOR PREPARING OLEFIN ESTERS

Benedetto Calcagno, and Luciano Cairati, both of Milan, Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy

Filed April 22, 1968, Ser. No. 723,311

Claims priority, application Italy, April 29, 1967, 15536 A/67

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 A 11 Claims

A process for preparing unsaturated esters from olefins and carboxylic acids is provided, in which the catalytic reaction medium is regenerated by precipitating the catalytic salts as carbonates, recovering them, and re-dissolving them in the acid for return to the reaction.

3,671,577

PROCESS FOR PRODUCING 1, 4-DIACYLOXY-2-BUTENE

Isao Ono; Kentaro Fukabori, and Seiichi Shimomura, all of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Oaza Tonda, Nanyo-cho, Tsuno-gun, Yamaguchi-ken, Japan

Filed March 13, 1970, Ser. No. 19,509

Claims priority, application Japan, March 18, 1969, 44/20099

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 A 13 Claims

1,4-diacyloxy-2-butene is produced by passing a gaseous mixture of butadiene, an aliphatic monocarboxylic acid and an oxygen-containing gas over a catalyst comprising at least one of palladium, iridium, platinum, rhodium and ruthenium and carboxylate and inorganic acid salt thereof.

3,671,578

PROCESS FOR THE PREPARATION OF NAPHTHALENE-2,6-DICARBOXYLIC ACID

Kazuo Ogata, and Kazuo Shimosato, both of Ehime-ken, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 5, 1969, Ser. No. 847,682

Int. Cl. C07c *51/00*

U.S. Cl. 260—515 P 4 Claims

A process for the industrially advantageous preparation of high purity naphthalene-2,6-dicarboxylic acid which is particularly suitable as the material in the preparation of high quality polyalkylene 2,6-naphthalenedicarboxylate with good qualitative reproducibility. This process comprises heating a monoalkali salt of naphthalene-2,6-dicarboxylic acid in water or water-containing organic medium to cause its disproportionation into the corresponding free dicarboxylic acid and dialkali salt thereof, and separating the precipitated free dicarboxylic acid.

3,671,579

PROCESS FOR OXIDIZING A 1,1-BIS(ALKYLPHENYL) ALKANE

Thomas P. Joyce, Jr., Penn Hills Township; Ralph W. Lagally, and Johann G. D. Schulz, both of Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed March 4, 1970, Ser. No. 16,598

Int. Cl. C07c *65/20*

U.S. Cl. 260—517 8 Claims

A process for converting a 1,1-bis(alkylphenyl)alkane to the corresponding benzophenone polycarboxylic acid which involves passing the 1,1-bis(alkylphenyl)alkane and aqueous nitric acid downwardly through a reactor maintained under oxidation conditions.

3,671,580

SUBSTITUTED BIPHENYL ACETIC ACIDS AND ESTER DERIVATIVES THEREOF

Tsung-Ying Shen, Westfield, and Conrad P. Dorn, Jr., Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 22, 1969, Ser. No. 887,416

Int. Cl. C07c *65/14*

U.S. Cl. 260—520 4 Claims

New 4(and 5)-substituted phenylacetic acids useful as anti-inflammatory, analgesic and anti-pyretic agents.

3,671,581

PRODUCTION OF CERTAIN CARBOXYLIC ACIDS

John Francis Edmund Keenan, Cheadle Hulme, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed April 24, 1969, Ser. No. 819,084

Int. Cl. C07c *51/00*, *51/30*

U.S. Cl. 260—527 R 12 Claims

Improvements in the production of carboxylic acids of the formula R—COOH wherein R represents alkyl of from four to six carbon atoms via their alkali metal salts are described, which improvements comprise reacting a starting material selected from

a. a methylketone of the formula R—$COCH_3$,

b. a mixture of said methyl ketone and the corresponding methyl alkyl carbinol of formula

c. the non-acidic by-product obtained from the oxidation of castor oil to produce sebacic acid,

R in (a) and (b) having the aforesaid meaning, with fused alkali metal hydroxide at a temperature between 250° and 375° C.

3,671,582

PROCESS FOR THE PREPARATION OF CARBONYL DERIVATIVES AND CARBOXYLIC ACIDS

Reginald David, and Jean Estienne, both of Lyon, Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Dec. 5, 1968, Ser. No. 781,594

Claims priority, application France, Dec. 6, 1967, 67131213

Int. Cl. C07c *51/32*

U.S. Cl. 260—533 R 8 Claims

Aldehydes, ketones and carboxylic acids are made by the oxidation of organic compounds, especially olefines, with oxygen in the presence of a Group VIII metal catalyst and in a liquid medium comprising dimethylsulphoxide alone or mixed with water.

3,671,583

GLUTARIC ACID DERIVATIVES

Rudolf G. Griot, Florham Park, and Mario G. Buzzolini, Morristown, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Filed March 25, 1968, Ser. No. 715,501

Int. Cl. C07c *59/12*, *33/10*

U.S. Cl. 260—535 P 2 Claims

This invention relates to 3-hydroxy-3-trifluoromethyl glutaric acid. The compound is useful as a hypolipidemic.

3,671,584

PROCESS FOR THE CONTINUOUS PRODUCTION OF α-CHLOROPROPIONIC ACID

Helmut Schlecht, Ludwigshafen, and Robert Aurnhammer, Limburgerhof, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed May 20, 1969, Ser. No. 826,267

Claims priority, application Germany, May 24, 1968, P 17 68 536.8

Int. Cl. C07c *53/32*

U.S. Cl. 260—539 R 6 Claims

An improved process for the continuous production of α-chloropropionic acid by reaction of propionic acid with chlorine in the presence of halides or acid halides of the elements phosphorus and sulfur at elevated temperature, the improvement consisting in carrying out the reaction in the presence of α-chloropropionic acid as solvent and distilling the resultant reaction mixture using the gas formed in the reaction as carrier gas. α-chloropropionic acid is used for the production of plant protection agents.

3,671,585

CARBONYLATION OF ORGANOBORANES

Herbert C. Brown, 1840 Garden Street, West, Lafayette, Ind.

Filed May 20, 1968, Ser. No. 730,654
Int. Cl. C07d *107/02*
U.S. Cl. 260—545 R 8 Claims

Organoboron derivatives of the general formula R_3CBO and $(R_3CBO)_3$ are formed by reacting an organoborane compound with carbon monoxide in the substantial absence of water at pressures of less than about 5 atmospheres and at temperatures ranging from about 25° to about 200° C. The organoboron derivatives may be used as additives for gasoline and diesel fuels. More importantly, they may be oxidized to form tertiary alcohols of the formula R_3COH.

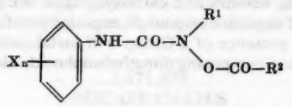
3,671,586

N-PHENYL-N'-ESTER UREA DERIVATIVES

Adolf Fischer, Mutterstadt/Pfalz; Karl-Heinz Koenig, Ludwigshafen/Rhine; Gustav Steinbrunn, Schwegenheim/Pfalz, and Albrecht Zschocke, Bad Duerkheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Division of Ser. No. 652,034, July 10, 1967, Pat. No. 3,621,055. This application June 23, 1970, Ser. No. 49,159
Int. Cl. C07c *127/22*
U.S. Cl. 260—545 R 7 Claims

Phenyl urea derivatives having the formula



wherein X, *n*, R^1 and R^2 have the meanings designated below, and method for controlling unwanted plant growth.

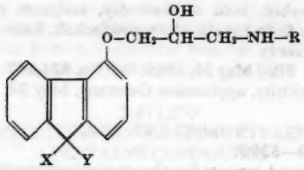
3,671,587

4-(2-HYDROXY-3-AMINOPROPOXY)-9-FLUORENONES AND THE SALTS THEREOF

Franz Troxler, Bottmingen, and Fritz Seemann, Basel, both of Switzerland, assignors to Sandoz Ltd., (a.k.a. Sandoz AG), Basel, Switzerland

Continuation-in-part of Ser. No. 779,268, Nov. 26, 1968, abandoned. This application May 26, 1970, Ser. No. 40,728
Claims priority, application Switzerland, June 3, 1969, 8399/69
Int. Cl. C07c *93/06*
U.S. Cl. 260—570.7 9 Claims

The present invention provides fluorene derivatives of formula,



in which R is isopropyl, secondary butyl, tertiary butyl, 3-phenylpropyl, 1-cyano-2-propyl,tert. pentyl or 3-pentyl, and either X is hydrogen and Y is hydroxy, or X and Y together are oxo, and pharmaceutically acceptable acid addition salts thereof.

The compounds of the invention exhibit β-blocking activity.

3,671,588

OXIDATION OF CYCLOHEXANE

Edward J. Murray, Snyder, and Leon O. Winstrom, East Aurora, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 30, 1969, Ser. No. 837,890
Int. Cl. C07c *45/02*
U.S. Cl. 260—586 B 6 Claims

The invention relates to an improvement in the liquid phase catalytic oxidation of cyclohexane to cyclohexanone and cyclohexanol at elevated temperatures and superatmospheric pressures using an oxygen containing gas, such as oxygen or air, while maintaining substantially anhydrous conditions by removal of water during the oxidation reaction. The improvement resides in the use of more than one part and less than about six parts by weight of benzene per part of cyclohexane in the oxidation feedstock. Significantly increased yields of the above oxidation products, particularly at high cyclohexane oxidation conversion levels, are realized by utilizing this process.

3,671,589

PROCESS FOR PREPARATION OF 2-SUBSTITUTED-1,3-CYCLOPENTANEDIONES

Edward J. Watson, and Dale H. LaBar, both of West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 656,708, July 28, 1967, abandoned. This application May 23, 1969, Ser. No. 827,133
Int. Cl. C07c *49/28*, *45/18*
U.S. Cl. 260—586 R 4 Claims

This invention is concerned with the process of preparing 2-substituted-1,3-cyclopentanediones in good yields by reacting a succinic anhydride with an appropriate carboxylic acid anhydride, in the presence of aluminum chloride, in a reaction-inert organic solvent.

3,671,590

PROCESS FOR FORMING CARBONYL COMPOUNDS

Herbert K. Wiese, Cranford, and Paul E. Burton, Westfield, both of N.J., assignors to Esso Research and Engineering Company

Continuation-in-part of Ser. No. 376,554, June 19, 1964, abandoned. This application Sept. 9, 1968, Ser. No. 758,623
Int. Cl. C07c *49/04*, *45/02*, *47/02*
U.S. Cl. 260—593 R 16 Claims

A process for the formation of carbonyl compounds and certain new ketone compositions by reacting the appropriate acyclic or alicyclic Type II, III, IV or V olefin with an organic nitrite in the presence of an acid catalyst. The specific end product(s) produced depend upon the starting olefin, type of organic nitrite employed, etc.

3,671,591

DEHYDROGENATION OF ALCOHOLS TO KETONES

Irving Schwager, Hopewell Junction; Robert J. Leak, Wappingers Falls, and Edward L. Cole, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed July 3, 1969, Ser. No. 839,082
Int. Cl. C07c *45/16*, *85/10*
U.S. Cl. 260—596 7 Claims

A Group VIII metal containing pyrolyzed polyacrylonitrile polymer catalyst and hydrocarbon conversion process for the dehydrogenation of alcohols to ketones particularly isopropyl alcohol to acetone and the hydrogenation of nitro compounds to amines, particularly 2-nitropropane to isopropyl amine by the use of said catalyst.

3,671,592

MODIFICATION OF ALICYCLIC OR ALIPHATIC DIEPOXY COMPOUNDS

Mitsuo Yoshihara, Takatsuki, and Kazunori Mizutani, Ibaraki, both of Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Nov. 12, 1969, Ser. No. 876,071

Claims priority, application Japan, Nov. 12, 1968, 43/82736

Int. Cl. C08g *30/12*; C07d *1/00*

U.S. Cl. 260—2 EP 7 Claims

This invention relates to a method of modifying alicyclic or aliphatic diepoxy compounds having two epoxy groups in the molecule, and is more particularly directed to the modification of the above mentioned diepoxy compounds which are low in the viscosity at the normal temperature with certain dicarboxylic acid and acid anhydride to increase the viscosity. The resultant materials are excellent electrical insulators and are suitable for compression molding, general molding, laminating and binding.

3,671,593

PROCESS FOR MAKING THIOPHENOL

Robert J. Laufer, Colts Neck, N.J., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 693,185, Dec. 26, 1967, abandoned. This application Jan. 26, 1970, Ser. No. 5,952

Int. Cl. C07c *149/28*

U.S. Cl. 260—609 D 8 Claims

An improved process for making thiophenol wherein high yields of thiophenol are obtained by reacting cyclohexane with a sulfurizing agent at a temperature above 350° C.

3,671,594

PREPARATION OF 2,3-DIBROMO-2-BUTENE-1,4-DIOL

Robert W. Wynn, and Max E. Chiddix, both of Easton, Pa., assignors to General Anilin & Film Corporation, New York, N.Y.

Filed Aug. 9, 1967, Ser. No. 659,318

Int. Cl. C07c *33/10*

U.S. Cl. 260—633 7 Claims

Process for the preparation of 2,3-dibromo-2-butene-1,4-diol which comprises reacting bromine with 2-butyne-1,4-diol in an aqueous medium at a temperature of about −10° to 100° C. and recovering the product produced.

3,671,595

PROCESS FOR THE PRODUCTION OF 1,2,4,5,6,7,8,8-OCTACHLORO-3A,4,7,7A-TETRANYDRO-4,7-METHANOINDANE

Henry K. Suzuki, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Dec. 29, 1969, Ser. No. 888,872

Int. Cl. C07c *17/04*; c07c *23/24*

U.S. Cl. 260—648 C 8 Claims

This invention discloses a process for the production of 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane by chlorinating 4,5,6,7,8,8-hexachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene in the presence of carbon disulfide.

3,671,596

LOW TEMPERATURE MELT CHLORINATION PROCESS

Harold Edward Bellis, North Tonawanda, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 2, 1968, Ser. No. 764,643

Int. Cl. C07c *17/06*

U.S. Cl. 260—658 R 13 Claims

A melt chlorination process which produces tetrachloroethane by chlorinating ethylene, vinyl chloride, ethylene dichloride, and mixtures thereof, with a melt consisting essentially of iron chloride, copper chloride, alkali metal chloride(s) and water by dispersing the material to be chlorinated in the melt whereby said material is chlorinated by the melt, wherein certain proportions and process conditions are utilized to provide desired product selectivity.

3,671,597

ISOMERIZATION PROCESS EMPLOYING A NOVEL HETEROGENEOUS CATALYST

Wolfram R. Kroll, Somerville, N.J., assignor to Esso Research and Engineering Company

Continuation-in-part of Ser. No. 674,709, Oct. 10, 1967, Pat. No. 3,536,632. This application July 17, 1970, Ser. No. 55,965

Int. Cl. C07c *5/24*, *13/28*

U.S. Cl. 260—666 PY 17 Claims

Aliphatic and cyclic mono-olefins, diolefins, and polyolefins are isomerized by contacting an organic feed containing said olefinic compounds with a heterogeneous conversion catalyst prepared by forming, in an inert atmosphere, complexes between a reduced transition metal and a support and thereafter stabilizing the complex by heating at elevated temperatures. The complex is formed by impregnating a suitable catalytic support material with a solution of a soluble Group IVB through VIIB and Group VIII transition metal; reducing the impregnated support with an organometallic reducing agent at a temperature of about ambient to about 60° C.; removing excess solvent and excess reducing agent, and thereafter heating the product at a temperature of 100° C. to about 600° C. under substantially anhydrous conditions.

3,671,598

ISOMERIZATION OF CYCLIC HYDROCARBONS

Robert E. Moore, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

Filed March 24, 1971, Ser. No. 127,772

Int. Cl. C07c *3/54*, *13/78*

U.S. Cl. 260—666 M 10 Claims

Saturated cyclic hydrocarbons having a carbon range of from seven to 50 carbon atoms are isomerized by contacting with sulfuric acid having an H_2SO_4 equivalent in the range of 85 to 102 percent by weight or fluorosulfonic acid and an adamantane hydrocarbon containing zero to four alkyl groups and at least one unsubstituted bridgehead position.

3,671,599

OXIDATIVE DEHYDROGENATION OF MULTICYCLIC HYDROCARBONS

Robert E. Moore, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed March 24, 1971, Ser. No. 127,784

Int. Cl. C07c *13/28*

U.S. Cl. 260—666 PY 8 Claims

Conjugated dienes of polycyclic naphthenes having three to 11 rings of five to six carbon atoms each of which at least three are adjacent fused rings are produced by contacting the polycyclic naphthenes with a strong acid and a monool or diol of an adamantane hydrocarbon having zero to four alkyl groups with at least one alkyl group at a non bridgehead position when the number of alkyl groups is four at a reaction temperature between the freezing point of the acid and 50° C., and recovering a polycyclic conjugated diene from the reaction mixture.

3,671,600
ETHYLATION OF ADAMANTANE NUCLEUS WITH BF ETHERATE

Robert E. Moore, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

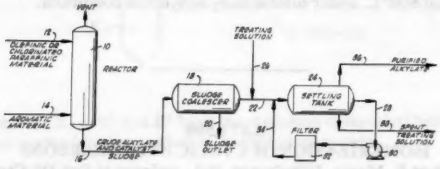
Filed Oct. 27, 1971, Ser. No. 193,148
Int. Cl. C07c 3/54, 13/28
U.S. Cl. 260—666 M 6 Claims

Adamantane hydrocarbons of the C_{10}–C_{30} range having one to four open bridgehead positions are ethylated by the reaction of a mixture of boron fluoride etherate and sulfuric acid (90–100 percent H_2SO_4 equivalent by weight) or fluorosulfonic acid ($HFSO_3$) at a temperature in the range of −10° to 100° C. During the reaction, the adamantane nucleus remains intact and any alkyl groups attached thereto in the adamantane hydrocarbon charge remain at the original position. Ethylation occurs only at bridgehead positions of the nucleus and from one to four alkyl or cycloalkyl groups can be substituted if such bridgehead positions are open in the starting hydrocarbon. The ethylation product has one or more ethyl substituents than the starting hydrocarbon, which substituents are attached to the adamantane nucleus at bridgehead positions.

3,671,601
PROCESS FOR THE PURIFICATION OF ALKYLATE

Charles L. Sanderson, Glen Burnie, and Earl S. Sauer, Baltimore, both of Md., assignors to Continental Oil Company, Ponca City, Okla.

Filed Sept. 3, 1970, Ser. No. 69,199
Int. Cl. C07c 3/56
U.S. Cl. 260—671 B 6 Claims



The present invention relates to the purification of crude alkylate produced by the reaction of an olefinic material or a chlorinated paraffinic material with an aromatic compound in the presence of an aluminum halide catalyst. By the present invention, a major portion of the entrained solid impurities resulting from the reaction are separated from the crude alkylate product. The crude alkylate is then contacted with an aqueous treating solution to remove remaining solids and other impurities therefrom and passed to a settling tank. While within the settling tank, the crude alkylate is separated from the treating solution by gravity, and treating solution-alkylate emulsion formed by and containing solids is accumulated at the interface between the layers of separated alkylate and treating solution. The emulsion and solids are withdrawn from the settling tank, passed through a filter whereby the emulsion is broken and the solids removed, with the resultant liquid filtrate being returned to the settling tank. Purified crude alkylate and spent treating solution substantially free from solids are removed from the settling tank.

3,671,602
TRANSALKYLATION OF AROMATIC HYDROCARBONS

Takehisa Inoue; Masaki Sato, and Takeshi Hashiguchi, all of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 24, 1970, Ser. No. 13,756
Claims priority, application Japan, Feb. 25, 1969, 44/13599; March 31, 1969, 44/23880; March 31, 1969, 44/23881; April 14, 1969, 44/28233
Int. Cl. C07c 3/62
U.S. Cl. 260—672 T 10 Claims

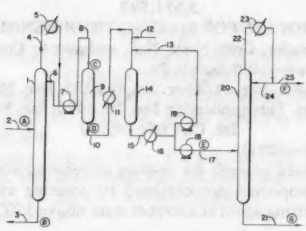
A process for the transalkylation of aromatic hydrocarbons of nine carbon atoms which comprises heat contacting the starting feed containing at least one aromatic hydrocarbon of nine carbon atoms as a main component in the presence of hydrogen gas with a catalyst selected from the group consisting of:

a. dealkalized mordenites,
b. compositions composed of a dealkalized mordenite and at least one metal selected from metals of Group I*b* or VI*a* of the Periodic Table, and
c. compositions composed of a dealkalized mordenite, an aluminum fluoride and at least one metal selected from metals of Group I*b* or VI*a* of Mendelejeff's Periodic Table.

3,671,603
BUTENE RECOVERY

Hugh J. Hagemeyer, Jr., Longview, and Harry F. Goss, White Oak, both of Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 10, 1970, Ser. No. 44,961
Int. Cl. C07c 11/02
U.S. Cl. 260—677 A 4 Claims



Butenes are recovered from hydrocarbon cracking streams by a process which comprises (1) distillation of the crude feed stream to remove C_5 and heavier materials, (2) desulfurization of the butene-containing stream, (3) partial hydrogenation of the desulfurized butene-containing stream to convert diolefins to monoolefins and (4) distillation of the hydrogenated butene-containing stream to remove C_3 and lighter materials. The recovered butene can be oxidized to form methyl ethyl ketone or hydrogenated to form valeraldehydes.

3,671,604
CATALYTIC COPOLYMERIZATION OF ACETYLENE AND MONOOLEFINS

Thomas F. Rutledge, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

Filed Oct. 21, 1970, Ser. No. 82,847
Int. Cl. C07c 11/02
U.S. Cl. 260—677 9 Claims

Disclosed is a process for the catalytic copolymerization of acetylene and olefins which comprises heating a mixture of acetylene and olefin in the presence of a catalyst comprising an acidic catalyst carrier having deposited thereon a compound selected from the group consisting of zinc acetate, zinc oxide, cadmium oxide, cadmium acetate, nickel oxide, nickel acetate, cobalt oxide, and cobalt acetate. The novel products produced by the process of this invention are useful for the preparation of motor fuels and polymeric coating compositions.

3,671,605
ISOMERIZATION OF ALLENES INTO THEIR CORRESPONDING TERMINAL ACETYLENIC ISOMERS

William Novis Smith, Jr., Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.

Division of Ser. No. 858,107, Sept. 15, 1969, abandoned. This application Dec. 14, 1970, Ser. No. 98,043
Int. Cl. C07c 11/24
U.S. Cl. 260—678 10 Claims

A catalyst for the isomerization of allenes into their corresponding terminal acetylenic isomers is prepared by com-

bining an alkali metal having an atomic weight greater than that of lithium with alumina in the presence of sufficient heat for the free alkali metal to melt and react with the alumina. Passing a stream of an allene compound through a bed of this catalyst converts the allene into the corresponding terminal acetylenic isomer.

3,671,606

OXIDATIVE DEHYDROGENATION UTILIZING MANGANESE FERRITE

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 671,237, Sept. 28, 1967, abandoned. This application Oct. 2, 1969, Ser. No. 863,380. The portion of the term of this patent subsequent to Jan. 7, 1968, has been disclaimed.

Int. Cl. C07c 5/18

U.S. Cl. 260—680 E **6 Claims**

Oxidative dehydrogenation of organic compounds in vapor phase utilizing manganese ferrite which has been prepared by heating precipitates which are the precursors of manganese ferrite.

3,671,607

METHOD FOR IMPACT MODIFICATION OF ETHYLENICALLY UNSATURATED NITRILE POLYMERS AND POLYMER BLENDS PRODUCED THEREBY

Yoon Chai Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 14, 1969, Ser. No. 866,375

Int. Cl. C08f 41/12, 37/18

U.S. Cl. 260—876 R **18 Claims**

A polyblend with good impact properties, good light stability, good heat stability, low water vapor transmission and low oxygen permeability has a polymerization graft component with a rubbery substrate and a composite superstrate. Initially, the rubbery substrate is grafted with a monomer mixture containing little or no nitrile monomer and generally comprised of monomers selected from the group consisting of monovinylidene aromatic hydrocarbon, alkyl esters of unsaturated carboxylic acids, unsaturated carboxylic acids, vinyl alkanoates and vinyl ethers. Thereafter, the resultant graft copolymer is admixed and grafted with a second monomer formulation containing at least 60 percent by weight of ethylenically unsaturated nitrile monomers. The resultant composite graft copolymer is then blended with a matrix of an ethylenically unsaturated nitrile polymer to provide the desired impact modified polymer blends.

3,671,608

PLASTIC COMPOSITION AND METHOD OF PREPARING SAME

Curtis L. Meredith, and George A. Von Bodungen, both of Baton Rouge, La., assignors to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Filed Nov. 21, 1969, Ser. No. 878,874

Int. Cl. C08f 15/04

U.S. Cl. 260—878 R **28 Claims**

An improved plastic composition formed by the reaction of an alkenyl aromatic monomer, an acrylic monomer and an interpolymer of ethylene, at least one other straight chain alpha-monoolefin and a compound selected from the group consisting of aliphatic and cycloaliphatic polyene compounds in the presence of a free radical catalyst in an organic solvent, and in the presence of a seed mixture comprising a mixture of said monomers and said interpolymer which has been reacted to at least 15 percent conversion based on said monomers.

3,671,609

NEW POLYMERIC COMPOSITIONS

Martin H. Kaufman, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 27, 1970, Ser. No. 58,699

Int. Cl. C08f 1/68, 3/20, 15/02

U.S. Cl. 260—879 **5 Claims**

Polymeric compositions characterized by being fiber-forming and stereospecific and capable of being melted and drawn into strong crystalline filaments and fibers. The compositions are useful as storage stable binders as well as adhesives for fluorcarbon material.

3,671,610

CROSS-LINKED GRAFT COPOLYMER OF STYRENE AND METHYL METHACRYLATE UPON A BUTADIENE POLYMER

Yasuo Amagi; Masaki Ohya; Zenya Shiiki, and Haruhiko Yusa, all of Iwaki-shi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 570,261, Aug. 4, 1966, abandoned. This application Nov. 14, 1969, Ser. No. 876,920

Claims priority, application Japan, Aug. 9, 1965, 40/48036; Feb. 5, 1966, 41/6652; Feb. 5, 1966, 41/6653

Int. Cl. C08f 19/08, 37/18

U.S. Cl. 260—880 R **2 Claims**

Butadiene-styrene-methyl metnacrylate copolymers prepared by graft-polymerization with cross-linked butadiene or polybutadiene-styrene copolymer latex of styrene-methyl methacrylate monomers and a cross-linking agent capable of copolymerizing with said monomers in two steps.

Polyvinyl chloride resins incorporated with the graft copolymer exhibits improved mechanical strength and other physical properties.

3,671,611

PHOSPHORUS ACID ESTERS

Hermann Nachbur, Dornach, and Arthur Maeder, Therwil, both of Switzerland, assignors to Ciba Limited

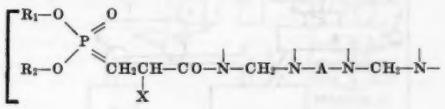
Filed Dec. 23, 1969, Ser. No. 887,729

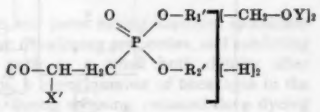
Claims priority, application Switzerland, Jan. 7, 1969, 124/69; July 8, 1969, 10370/69

Int. Cl. C07f 9/40

U.S. Cl. 260—932 **14 Claims**

Phosphorus compounds are provided which correspond to the formula





in which each R is an alkyl, alkenyl or halogenalkyl radical, X and X′ each is a methyl group or a hydrogen atom, A is a —C-O—, —CS—, —SO_2—, —CNH— or —CO—NE—CO— radical, wherein E is a hydrogen atom or a Y—CH_2—O— radical and wherein Y is an alkyl radical or a hydrogen atom. The phosphorus compounds are manufactured from the corresponding phosphorus carboxylic acid amides, a diamide and

formaldehyde. These compounds optionally together with a curable aminoplast precondensate are useful for flameproofing and creaseproofing of cellulose-containing fiber materials.

3,671,612

PROCESS FOR THE MANUFACTURE OF AMMONIUM DIALKYLDITHIOPHOSPHATES

Hilmar Roszinski, Kendenich near Cologne, and Heinz Harnisch, Loevenich near Cologne, both of Germany, assignors to Knapsack Aktiengesellschaft, Cologne, Germany

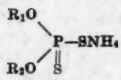
Filed March 21, 1969, Ser. No. 809,408

Claims priority, application Germany, April 5, 1968, P 17 68 151.5

Int. Cl. C07f 9/16

U.S. Cl. 260—987 7 Claims

Production of noncaking ammonium dialkyldithiophosphates of the general formula:



in which R_1 and R_2 represent identical or different alkyl radicals having from one to six carbon atoms. The phosphates are produced by mixing dialkyldithiophosphoric acids with an alcohol in a molar ratio of smaller than 1:0.25, introducing gaseous ammonia into the resulting mixture, filtering off precipitated salt, washing the salt and drying it.

3,671,613

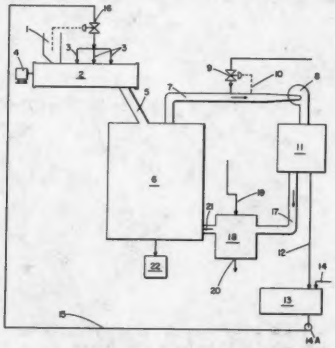
PELLETING OF OIL-COATED CARBON PARTICLES

William W. Gotshall, Orchard Lake, Mich., assignor to Marathon Oil Company, Findlay, Ohio

Filed March 25, 1970, Ser. No. 22,647

Int. Cl. B01j 2/12

U.S. Cl. 264—115 8 Claims



Oil-coated pulverized carbon particles are pelleted by mixing with roughly 5 to 15 percent by weight methanol, then drying in a solvent recovery system to provide a pelletized product while leaving the oil-coatings intact.

3,671,614

AROMATIC POLYAMIDES CONTAINING THE QUINAZOLONE RING

Hans-Egon Kunzel; Gerhard Dieter Wolf, both of Dormagen; Gunter Blankenstein, Stommeln, and Gunther Nischk, Dormagen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 19, 1969, Ser. No. 878,237

Claims priority, application Germany, Nov. 28, 1968, P 18 11 411.9

Int. Cl. C08g 20/20

U.S. Cl. 260—47 CZ 16 Claims

New thermally stable aromatic polyamides that are soluble in organic solvents, which polyamides contain quinazolone ring systems and which are produced by poly-condensation of aromatic diamines having one or two quinazolone ring systems in their molecule and aromatic dicarboxylic acid dihalides.

ERRATA

For Classes 260—210, 260—240, 260—252, 260—294, 260—463 and 260—539 see:
Patent Nos. 3,671,647 thru 3,671,652

3,671,615

METHOD OF MAKING A COMPOSITE BOARD PRODUCT FROM SCRAP MATERIALS

Herbert K. Price, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Nov. 10, 1970, Ser. No. 88,275

Int. Cl. D21b 1/07

U.S. Cl. 264—39 11 Claims

A method of making a composite board product from scrap materials such as are customarily available from a printing plant. The scrap materials are derived from three types of materials designated herein as plastic materials, fibrous materials and filler materials. The scrap materials are shredded or pulverized into small particles after which particles of a specified size are separated, filtered or culled out for further processing. The separated particles of the required size are homogenized in a mixing step and then placed in a preheated mold. Here the particles are subjected to unusually low pressure and temperature while formed into a finished product with the aid of a platen press. Typical finished products are employed as floor tiles, counter tops, wall panels or insulation.

ERRATUM

For Class 264—39 see:
Patent No. 3,671,654

3,671,616

METHOD OF MANUFACTURING BALL-PENS

Tozaburo Nakata, deceased, late of Tokyo, Japan, and by Fusahide Nakata, heir, 4-14 Kita 1-chome, Loenji-Suginami-ku, Japan

Continuation of Ser. No. 716,873, March 27, 1968, abandoned. This application Aug. 6, 1970, Ser. No. 61,862

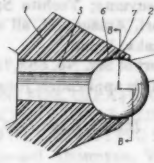
Claims priority, application Japan, March 30, 1967, 42/20120

Int. Cl. B29d 23/00

U.S. Cl. 264—68 4 Claims

Ball pen tips are made of a heat moldable synthetic resin by molding and a steel ball is inserted in an inwardly diverging

ball-embracing recess of the molded tip then the outwardly



opening ball-embracing tip portion is squeezed under pressure during heating at predetermined temperatures.

3,671,617

METHOD OF DRAWING THERMOPLASTIC SYNTHETIC RESIN FILM OVER A POLYANGULAR MANDREL

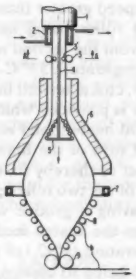
Sadao Nagase, Mie, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1969, Ser. No. 881,096

Claims priority, application Japan, Oct. 22, 1969, 44/84436; Nov. 30, 1968, 43/87799

Int. Cl. B29c *23/00*

U.S. Cl. 264—89 **6 Claims**



A method of drawing a tubular thermoplastic resin film comprising transporting said tubular film onto a mandrel which has a polyangular conical shape, causing the uniform occurrence of necking initiation points around the circumference of said film by drawing said film around said mandrel, and continuing to draw said film by the action of fluid pressure exerted within said film after said film has passed over said mandrel.

3,671,618

METHOD FOR DRY PRESSING CERAMIC TILE

William W. Huber, North Canton, and Richard L. Dana, Canton, both of Ohio, assignors to United States Ceramic Tile Company, Canton, Ohio

Division of Ser. No. 636,983, May 8, 1967, Pat. No. 3,523,344. **This application April 30, 1970, Ser. No. 43,628**

Int. Cl. B28b *3/00*

U.S. Cl. 264—120 **7 Claims**

A method is illustrated for dry pressing granular ceramic material in situ by subjecting the material to a first peak pressure, then relieving the pressure on the pressed material while confining the material to retain its general pressed form and subsequently applying pressure to the material which is no greater than the original pressure applied but no less than 75 percent thereof.

3,671,619

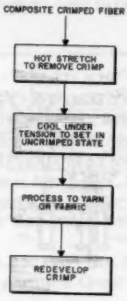
CRIMP RESERVATION PROCESS

Warren E. Fitzgerald; John P. Knudsen, both of Raleigh, and Jessie O. Brock, Cary, all of N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 331,890, Dec. 19, 1963, abandoned. This application March 8, 1967, Ser. No. 621,650

Int. Cl. D01d *5/22*

U.S. Cl. 264—168 **8 Claims**


COMPOSITE CRIMPED FIBER
HOT STRETCH TO REMOVE CRIMP
COOL UNDER TENSION TO SET IN UNCRIMPED STATE
PROCESS TO YARN OR FABRIC
REDEVELOP CRIMP

There is disclosed a process for reserving and redeveloping crimp involving removing the crimp from self-crimped composite fibers, which originally developed their crimp under rather severe temperature or humidity conditions or both, then processing the decrimped fiber to the desired end product and finally redeveloping the original crimp by mild processing conditions.

3,671,620

PROCESS FOR THE MANUFACTURE OF COMPOSITE FILAMENTS AND YARNS

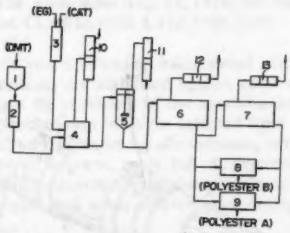
Takeshi Inoue, Kurashiki, Okayama Prefecture, Japan, assignor to Kurashiki Rayon Co., Ltd., Okayama Orefecture, Japan

Filed July 25, 1969, Ser. No. 844,910

Claims priority, application Japan, July 27, 1968, 43/53241

Int. Cl. B29f *3/10*

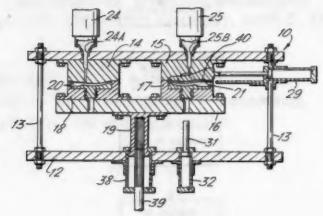
U.S. Cl. 264—171 **7 Claims**



Composite filaments and yarns having excellent spinnability, dyeability and crimp developing properties, and exhibiting improved development of crimps, a lower number of breakages in the monofilament or yarn during spinning, reduced deep dyeing defects, improved natural draw ratio, and development of fine, uniform helical crimps are obtained by melt-spinning component (A) a mixture, preferably having Mw/Mn of more than 2.5 selected from (i) mixtures obtained by continuously mixing an end product in the molten state obtained by a multistep continuous polycondensation reaction with at least one intermediate product in the molten state occurring in this polycondensation reaction system, and (ii) mixtures obtained by continuously mixing at least two of said intermediate

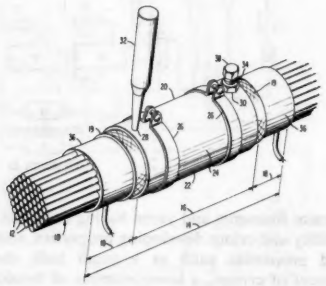
products, and component (B) at least one polymer having a viscosity different from that of component (A).

3,671,621
INJECTION MOLDING METHOD FOR SANDALS
Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome-Minami-Fukushima, Tokushima, Japan
Filed July 1, 1970, Ser. No. 51,568
Int. Cl. B29b *1/00*; B29h *7/08*; A43d *65/00*
U.S. Cl. 264—244 **1 Claim**



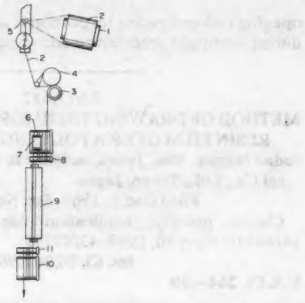
The method according to the present invention comprises injecting the first resinous material into the first cavity of a movable mold, cooling the material into a cured condition, shifting the movable mold with the cured first material up to the second stational mold, injecting the second resinous material into the second cavity, cooling the second material into a cured condition and finally releasing the articles from the mold.

3,671,622
METHOD OF FORMING SEAL FOR MULTI-WIRE STRAND
Darral V. Humphries, Allentown, Pa., assignor to Bethlehem Steel Corporation
Division of Ser. No. 779,536, Dec. 27, 1968. This application Nov. 13, 1970, Ser. No. 89,335
Int. Cl. B29c *6/00*; B29g *7/00*
U.S. Cl. 264—263 **2 Claims**



A short length of a multi-wire strand is surrounded with a mold to provide an annular space about said length. Said space is filled with a thermosetting plastic sealant and pressure is applied to force said sealant into and along the interstices of said strand. During said application of pressure, the strand is circumferentially heated at the ends of said mold to provide a radial temperature gradient across said ends. Pressure is applied to said sealant until the ends of the seal are substantially convex.

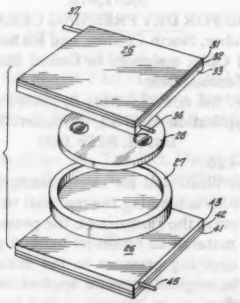
3,671,623
METHOD OF DRAWING AND HEAT TREATING SYNTHETIC FILAMENTS
Takaaki Fukushima, Mihara; Haruki Takizawa, Matsuyama; Kikuo Hori, Matsuyama; Yoshito Sato, Matsuyama, and Haruhiki Mizumori, Amagasaki, all of Japan, assignors to Teijin Limited, Osaka, Japan
Continuation-in-part of Ser. No. 658,799, Aug. 7, 1967, Pat. No. 3,539,680. This application June 29, 1970, Ser. No. 50,809
Int. Cl. B29c *17/02*
U.S. Cl. 264—290 **5 Claims**



A method of drawing and heat treating undrawn filaments of condensation polymer between a heated feed roller rotating at a constant peripheral speed and a draw roller rotating a constant peripheral speed greater than that of the former, the surface of said feed roller being heated at a temperature within the range of from the second order transition point of said filaments to a temperature 55° C. higher than the second order transition point, characterized in that,

a. a pressure roller is provided which rotates by contacting with the aforesaid heated feed roller and presses against at least the final turn of the filament wound around the heated feed roller to thereby fix the necking point at the point of contact of the two rollers; and
b. a slit heater having a groove width of 0.5–3.0 mm is disposed between the heated feed roller and the drawing roller, the temperature (y° C.) of the slit heater and treating time (x sec.) being so chosen as to satisfy the following conditions: $y \geq -1770.8x + 255$, $100 \leq y \leq 400$, and $0.01 \leq x \leq 0.12$.

3,671,624
METHOD OF USING A PORTABLE COOLING PLATEN
Michael P. Antalek, c/o Texaco Inc., P.O. Box 509, Beacon, N.Y.
Division of Ser. No. 739,801, June 25, 1968, abandoned. This application April 30, 1970, Ser. No. 43,622
Int. Cl. B29c *3/00*
U.S. Cl. 264—294 **5 Claims**



A method of cooling a molded plastic article in a press without cooling the heated press platens. It employs portable

cooling platens and involves opening the press, inserting the cooling platens and reapplying pressure while cooling the plastic article until it is frozen.

3,671,625

COMPOSITIONS FOR TREATING ASTHMA COMPRISING BIS-CHROMONYL COMPOUNDS AND METHOD OF EMPLOYING SAME

Roger Edward Collingwood Altounyan, Wilmslow, England, assignor to Fisons Pharmaceuticals Limited, Leicestershire, England

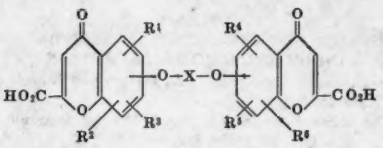
Continuation of Ser. No. 650,663, July 3, 1967, abandoned, which is a continuation of Ser. No. 536,285, March 22, 1966, abandoned. This application March 12, 1970, Ser. No. 19,119

Claims priority, application Great Britain, Dec. 17, 1965, 53,744/65

Int. Cl. A61k *13/00, 27/00*

U.S. Cl. 424—45 **14 Claims**

Bis-chromonyl compounds of the formula:



and therapeutically acceptable salts, esters and amides thereof, wherein R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different and each is H or halogen, lower alkyl, hydroxy, lower alkoxy, substituted lower alkyl or substituted lower alkoxy, and X is a saturated or unsaturated, substituted or unsubstituted, straight or branched polymethylene chain which may be interrupted by one or more carbocyclic rings or oxygen-containing heterocyclic rings, oxygen atoms or carbonyl groups are particularly useful for the relief and prophylaxis of asthma when mixed with bronchodilators.

3,671,626

INHIBITING DENTAL PLAQUE

Carl B. Felger, College Park, Md., assignor to The Gillette Company, Boston, Mass.

Filed Dec. 14, 1970, Ser. No. 98,068

Int. Cl. A61r *7/16*

U.S. Cl. 424—49 **19 Claims**

Inhibiting the formation of dental plaque with a composition comprising about 0.05 to 3 percent by weight of pyromellitic acid in a physiologically acceptable vehicle.

3,671,627

REACTION PRODUCTS OF PLACENTA EXTRACTS AND PENICILLIN

Louis W. Granirer, deceased, late of Belle Harbor, N.Y.; by Minna B. Granirer, executor; by Samuel Granirer, executor, both of Belle Harbor, N.Y., and by Robert I. Pearlman, executor, Elizabeth, N.J., assignors to Minna B. Granirer, Belle Harbor, N.Y.

Division of Ser. No. 701,465, Nov. 7, 1967, Pat. No. 3,584,117, which is a continuation-in-part of Ser. Nos. 113,059, May 29, 1961, abandoned, and Ser. No. 299,114, July 31, 1964, abandoned. This application June 5, 1969, Ser. No. 830,884

Int. Cl. A61k *21/00, 17/00*

U.S. Cl. 424—105 **12 Claims**

The present invention relates to new penicillin formulations formed by contacting penicillin and pharmaceutically acceptable salt complexes formed from extracts of placenta.

3,671,628

TIRANDAMYCIN AND PROCESS FOR MAKING SAME

Oldrich K. Sebek, Kalamazoo, and Curtis E. Meyer, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 8, 1969, Ser. No. 856,082

Int. Cl. A61k *21/00*

U.S. Cl. 424—120 **9 Claims**

Antibiotic tirandamycin producible by culturing *Streptomyces tirandis* var. tirandis in an aqueous nutrient medium. Tirandamycin is active against *Bacillus subtiles* and can be used to minimize or prevent odor in fish and fish crates caused by this organism.

3,671,629

STERILIZING COMPOSITION COMPRISING POTASSIUM MONOPERSULPHATE AND SODIUM CHLORIDE COATED WITH AN EDIBLE OIL AND MAGNESIUM STEARATE

Alan A. Levy, Stanmore; Mitchell N. Rodger, High Wycombe, and Geoffrey D. Breach, South Norwood, London, all of England, assignors to Richardson-Merrell Limited, London, England

Filed Feb. 16, 1968, Ser. No. 705,940

Claims priority, application Great Britain, Feb. 21, 1967, 8,308/67

Int. Cl. A01n *17/00*

U.S. Cl. 424—153 **7 Claims**

In order to maintain uniformity of composition when fed into small packages from bulk, the individual particles of the salts in a solid water soluble sterilizing composition, containing an alkali metal monopersulphate and an alkali metal chloride, are coated with a non-aqueous physiologically acceptable liquid, such as corn oil or medicinal paraffin, and a solid anti-static lubricant, such as magnesium stearate.

3,671,630

HALOGENATED PHENOLIC GERMICIDAL COMPOSITIONS CONTAINING TERPENE COLOR STABILIZERS

Francis Emery Carroll, Wyckoff, and Walter Charles Seebold, Westwood, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 673,264, Oct. 6, 1967, abandoned. This application Aug. 17, 1970, Ser. No. 64,623

Int. Cl. A01n *9/30;* **C11d** *3/48, 9/50*

U.S. Cl. 424—174 **22 Claims**

Aqueous solutions containing halogenated phenolic germicidal compositions are stabilized against color change on exposure to light by providing in the solutions an effective amount of a discoloration inhibitor selected from the group consisting of alpha-phellandrene, allo ocimene, ocimene, terpinolene, myrcene, isoprene, rosin, tall oil, myrcene hydrate, and abietic acid. The solutions may also contain up to 35 percent of a detergent and other conventional detergent adjuvants.

3,671,631

METHOD FOR CONTROL OF HELMINTHS IN WARM-BLOODED ANIMALS USING PHOSPHINYLDITHIOCARBAMATES.

Mary Ehlers Doscher, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

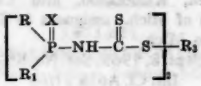
Filed April 15, 1971, Ser. No. 134,454

Int. Cl. A61k *27/00*

U.S. Cl. 424—205 **10 Claims**

This invention relates to a novel method for controlling helminths in warm-blooded animals. More particularly, the invention relates to a method for the control of helminths in warm-blooded animals by administering to said animals, an

anthelmintically effective amount of a compound of the formula:



wherein R and R_1 are each members selected from the group consisting of loweralkyl, loweralkoxy and phenyl; X is sulfur or oxygen; and R_2 is a loweralkylene radical, such as ethylene, loweralkyl substituted ethylene, trimethylene, loweralkyl substituted trimethylene, oxydimethylene, tetramethylene or loweralkyl substituted tetramethylene.

3,671,632

INSECTICIDAL COMPOSITIONS OF ENDOSULFAN IN FENITROTHION FOR U.L.V. TREATMENT

Claude S. Aronica, Ecully, and Louis Moulin, Tassin La Demi Lune, both of France, assignors to Pechiney-Progil, Lyon, France

Filed Sept. 15, 1969, Ser. No. 858,108

Claims priority, application France, Sept. 16, 1968, 6850388

Int. Cl. A01n 9/36, 9/28

U.S. Cl. 424—218 **3 Claims**

A composition comprising a solution of endosulfan in fenitrothion is used to control insect parasites on plants, particularly cotton plants. The composition is suitable for use in ultra low volume treatment of plants and may be sprayed from an aircraft.

3,671,633

PROCESS FOR TABLETTING ACETAZOLAMIDE

Prabhakar Ranchhordas Sheth, Nanuet, N.Y., and James Henry Wiley, Westwood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 783,765, Dec. 13, 1968, abandoned. This application May 10, 1971, Ser. No. 141,974

Int. Cl. A61j 3/10

U.S. Cl. 424—273 **6 Claims**

A process for producing pharmaceutically acceptable tables of acetazolamide which comprises compressing a mixture containing a binder and a mixture of acetazolamide crystals. The mixture of acetazolamide crystals is characterized by a binodal size distribution and is obtained by adding acetazolamide seed crystals to a saturated solution of acetazolamide while cooling and agitating the mixture of seed crystals and solution.

3,671,634

STABLE AQUEOUS ANTI-DANDRUFF SHAMPOO CONTAINING CAPTAN

Bernard C. Carlson, Weston, and Francis E. Hutchins, Norwalk, both of Conn., assignors to R. T. Vanderbilt Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 570,053, Aug. 3, 1966, abandoned. This application Feb. 16, 1970, Ser. No. 11,788

Int. Cl. A61k

U.S. Cl. 424—274 **4 Claims**

N-Trichloromethyltrhio-4-cyclohexene-1,2-dicarboximide (captan) may be incorporated in an aqueous shampoo formulation having an acceptable shelf life if the pH of the formulation is in the range of from about 3.0 to about 7.0 and the detergent is at least one of an organic sulfate or sulfonate detergent or a non-ionic detergent free from amino nitrogen.

ERRATUM

For Class 424—305 see:
Patent No. 3,671,532

3,671,635

CHEMOSTERILANT COMPOSITIONS FOR FLIES AND METHOD OF USE

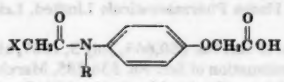
Philip C. Hamm, Glendale, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 677,082, Oct. 23, 1967, abandoned. This application May 27, 1970, Ser. No. 41,100

Int. Cl. A01n 9/24

U.S. Cl. 424—319 **7 Claims**

Compounds of the following formula are insect chemosterilants:



wherein R is alkyl of not more than four carbon atoms and X is halogen (Cl, Br, F and I).

3,671,636

METHODS FOR TREATING HYPERTENSION OR INHIBITING GASTRIC SECRETION

Walfred S. Saari, Landsdale, Pa., assignor to Merck & Co, Inc., Rahway, N.J.

Division of Ser. No. 636,586, May 8, 1967. This application Oct. 29, 1969, Ser. No. 871,214

Int. Cl. A61k 27/00

U.S. Cl. 424—330 **8 Claims**

Novel derivatives of 3-hydroxy-α-(1-aminoethyl)-benzyl alcohol particularly 3-ether derivatives of erythro and threo 3-hydroxy-α-[1-aminoethyl]-benzyl alcohol and their pure enantiomers are described. Also processes for the preparation of the above identified compounds are shown.

The novel derivatives of 3-hydroxy-α-(1-aminoethyl)-benzyl alcohol are useful as antihypertensive agents and inhibitors of gastric secretion.

3,671,637

REPELLANT COMPOSITION COMPRISING CERTAIN CYCLOHEXYL UREAS AND THIOUREAS

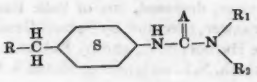
Richard N Knowles, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 635,301, April 20, 1967, which is a continuation-in-part of Ser. No. 574,498, Aug. 18, 1966. This application Oct. 24, 1968, Ser. No. 770,448

Int. Cl. A01n 9/12, 9/18, 9/20

U.S. Cl. 424—322 **10 Claims**

Repelling animals with 1-(4-higher alkyl-substituted cyclohexyl)-3-alkyl and 3,3-dialkylureas and thioureas of the formula:



wherein

R is alkyl, cycloalkyl, cycloalkylalkyl, bicycloalkyl or tricycloalkyl;

R_1 and R_2 are hydrogen, alkyl, haloalkyl, cyanoalkyl, nitroalkyl, alkoxyalkyl, or thioalkoxyalkyl, and

A is oxygen or sulfur. Typical is 1-(cis-4-cyclohexylmethyl-cyclohexyl-3-methyl-urea useful as an animal repellant.

3,671,638

ANIMAL REPELLENT METHODS USING SUBSTITUTED CYCLOHEXYL UREAS

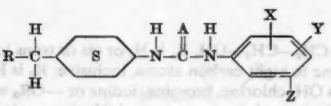
Richard N. Knowles, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 635,307, April 20, 1967, which is a continuation-in-part of Ser. No. 574,499, Aug. 18, 1966. This application Oct. 24, 1968, Ser. No. 770,450

Int. Cl. A01n *7/00, 9/20*

U.S. Cl. 424—322 9 Claims

Repelling animals with compounds of the formula:



wherein

A is oxygen or sulfur,

R is alkyl, cycloalkyl, cycloalkylalkyl, bicycloalkyl and tricycloalkyl.

Typical is 1-phenyl-3-(cis-4-cyclohexylmethylcyclohexyl)-urea useful as an animal repellent.

3,671,639

1-PHENYL-4,4-DI-SUBSTITUTED-THIOSEMICARBAZIDE FUNGICIDAL AND ACARICIDAL AGENTS

Klaus Sasse; Hans Scheinpflug, and Ferdinand Grews, all of c/o Farbenfabriken Bayer AG, Leverkusen, Germany

Filed June 30, 1969, Ser. No. 837,933

Claims priority, application Germany, July 2, 1968, P 17 67 924.2

Int. Cl. A01n *9/12*

U.S. Cl. 424—323 9 Claims

Fungicidal and acaricidal compositions of and methods of combatting fungi and acarids using certain 1-phenyl-4,4-di-substituted-thiosemicarbazides, i.e., 1-(optionally mono to tri chloro, bromo, methyl and methoxy -substituted)-phenyl-4,4-[di(alkyl and alkenyl) or tetramethylene, pentamethylene, oxa -pentamethylene or thia-pentamethylene]-thiosemicarbazides.

3,671,640

2-METHOXY-4-METHYLPHENYL-N-METHYLCARBAMATE AND INSECTICIDAL COMPOSITIONS CONTAINING THE SAME

Tatsumi Nishimura, Shimizu; Tadahiko Inoue, Ogasagun; Takeo Tsuboi, Ikeda, and Masaru Kado, Yokohama, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Filed July 2, 1969, Ser. No. 838,700

Int. Cl. C07c *125/06*; A01n *9/24*

U.S. Cl. 424—300 2 Claims

Novel 2-methoxy-4-methylphenyl-N-methyl-carbamate and insecticidal compositions comprising the same as an active ingredient.

3,671,641

METHODS OF COMBATTING BACTERIA AND FUNGI USING CYANOALKYL ESTERS OF 2-HALOACRYLIC AND 2,3-DIHALO PROPIONIC ACIDS

John D. Buckman; John D. Pera, and Fred W. Raths, all of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Jan. 2, 1969, Ser. No. 789,082

Int. Cl. A01n *9/20*

U.S. Cl. 424—304 7 Claims

Substituted alkyl esters of 2-haloacrylic and 2,3-dihalo propionic acids and their use in controlling micro-organisms, nematodes, and insects are described.

ERRATUM

For Class 424—312 see:
Patent No. 3,671,654

3,671,642

N-ACYLCYCLOHEXYLAMINE REPELLANTS AND METHODS OF USE

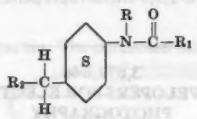
Richard N. Knowles, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 635,306, April 20, 1967, which is a continuation-in-part of Ser. No. 574,276, Aug. 18, 1966. This application Oct. 24, 1968, Ser. No. 770,447

Int. Cl. A01n *9/20, 23/00*

U.S. Cl. 424—320 10 Claims

Repelling animals with N-acylcyclohexylamines of the formula:



wherein

R is hydrogen, methyl, or ethyl;

R_1 is hydrogen or alkyl of one through four carbon atoms; and

R_2 is straight chain or branched alkyl of three through eight carbon atoms.

Typical is N-acetyl-cis-4-n-butylcyclohexylamine useful for repelling animals.

3,671,643

TREATMENT OF EXCESSIVE SEBACEOUS GLANDS SECRETION WITH SUBSTITUTED CYSTEAMINE COMPOUNDS

Gregoire Kalopissis, Paris, France, assignor to Societe Anonyme dite:-L'Oreal, Paris, France

Continuation-in-part of Ser. No. 736,960, June 14, 1968, abandoned, Continuation-in-part of Ser. No. 801,840, Feb. 24, 1969. This application Sept. 15, 1969, Ser. No. 858,161

Claims priority, application France, Jan. 29, 1964, 641472021; Luxembourg, Dec. 22, 1965, 55553; France, June 21, 1967, 671560250; July 28, 1967, 6794913; Luxembourg, Feb. 23, 1968, 55553; April 19, 1968, 55935; Belgium, June 3, 1969, 733993

Int. Cl. A61k *27/00*

U.S. Cl. 424—330 2 Claims

A process of treating acne with a composition containing substituted cysteamine compounds.

3,671,644

ANTISEPTIC COMPOSITIONS CONTAINING PHENOLIC BACTERICIDES POTENTIATED WITH PHOSPHONIC ACID DERIVATIVES

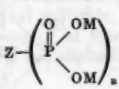
Riyad R. Irani, and H. Evan Roberts, both of St. Louis, Mo., assignors to Monsanto Chemical Company, St. Louis, Mo.

Continuation of Ser. No. 352,942, March 18, 1964. This application July 18, 1969, Ser. No. 872,437

Int. Cl. A61k *27/00, 13/00*

U.S. Cl. 424—346 5 Claims

An antiseptic composition is described containing a phenolic or quaternary ammonium bactericide and, as a potentiating agent, a water-soluble polyphosphonic acid compound having the formula



wherein n is an integer from 2 to 3 inclusive, M is a member selected from the group consisting of hydrogen and cations, and Z is a connecting radical equal in valence to n and containing not more than about 12 atoms, exclusive of hydrogen, in chemical combination, as well as compositions containing the foregoing and other additives such as are found in sanitizing compositions, antiseptic detergent compositions, cosmetic compositions, drilling mud compositions and the like.

3,671,645
METHOD FOR INDUCING ANETHESIA

Bernard M. Regan, Chicago, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Division of Ser. No. 699,060, Jan. 19, 1968, Pat. No. 3,579,595. This application June 29, 1970, Ser. No. 60,179
Int. Cl. A61k *13/00*
U.S. Cl. 424—351 **1 Claim**

1-bromo-1-chloro-2,3,3-trifluoropropene, useful as a general anesthetic.

3,671,646
LIQUID DEVELOPERS FOR ELECTROSTATIC PHOTOGRAPHY

Takaji Kurita; Masaya Motoki; Kazuhiro Emoto, and Katsuo Hojo, all of Otokuni-gun, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed July 24, 1969, Ser. No. 844,598
Claims priority, application Japan, July 27, 1968, 43/53234; Feb. 14, 1969, 44/131769
Int. Cl. G03g *9/04*
U.S. Cl. 252—62.1 **9 Claims**

A liquid developer for electrostatic photography is prepared by dispersing in a dispersion medium composed essentially of a paraffinic hydrocarbon, an alkylaminoethyl methacrylate-containing polymer; a carboxyl group-containing copolymer or acrylic or methacrylic acid and an ester thereof; a coloring material; and/or a dihydroabietic ester.

Colloidal particles of the developer have favorable electric charging properties, and, after development of a photoconductive material and simultaneously with the drying of the liquid, they firmly adhere to the photo-sensitive layer to give a clear image. Further, the developer, which is a colloidal dispersion system, is stable and does not easily cause precipitation or agglomeration.

3,671,647
LINCOMYCIN 3-NUCLEOTIDES AND THE SALTS THEREOF

Alexander D. Argoudelis, and John H. Coats, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 30,254, April 20, 1970, abandoned. This application March 24, 1971, Ser. No. 127,852
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 R **19 Claims**

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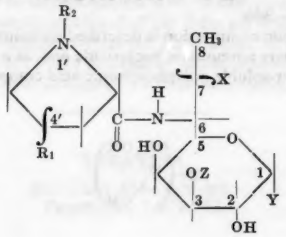
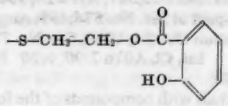
This invention relates to novel antibacterial compounds and to processes for preparing them. It is particularly directed to novel 3-nucleotides of lincomycin, and of analogs thereof, and of celesticetins. The compounds of the invention can be shown by the following formula:



wherein Y is —SR wherein R is alkyl of one to six carbon atoms, inclusive,



, or —S—CH_2—CH_2—OH, R_1 is H, or cis or trans lower-alkyl of from one to eight carbon atoms, inclusive; R_2 is H, CH_3, or C_2H_5; X is OH, chlorine, bromine, iodine or —OR_3 wherein R_3 is alkyl of one to six carbon atoms, inclusive, each in the (R) or (S) configuration; and Z is a nucleoside —5′— phosphate group wherein said nucleoside can be adenosine, guanosine, cytidine or uridine; and salts thereof.

Examples of alkyl of from one to eight carbon atoms are methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, and octyl and isomers thereof.

3,671,648
CARBOCYANINE FILTER DYES AND SENSITIZERS FOR SILVER HALIDE EMULSIONS

Arthur Fumia, Jr.; Donald W. Heseltine, and Leslie G. S. Brooker, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 574,947, Aug. 25, 1966. This application May 15, 1969, Ser. No. 825,072
Int. Cl. C09b *23/08*
U.S. Cl. 260—240 R **11 Claims**

New tricarbocyanine dyes derived from enamine and enaminium salts are useful as filter dyes and spectral sensitizers for photographic silver halide emulsions. They sensitize such emulsions over a wavelength range of about from 660 to 850 μ, and higher in some instances, with maximum sensitivity ranging about from 750 to 800 μ.

3,671,649
PRODUCTION OF A HETEROCYCLIC COMPOUND HAVING AN IMIDAZOLE RING

Yoshitaka Yamada; Moritaro Sakurai, and Izumi Kumashiro, all of Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed April 11, 1969, Ser. No. 816,061
Claims priority, application Japan, Apr. 15, 1968, 43/24764
Int. Cl. C07d *57/64, 49/34*
U.S. Cl. 260—252 **8 Claims**

Adenine (AD) and/or 4,5-dicyanoimidazole (DCI) and derivatives thereof (2,8-methyl-AD and/or 2-methyl-DCI) are produced by the reaction of diaminomaleonitrile or diaminofumalonitrile with an amidine salt in an organic medium.

AD and DCI have been industrially produced by heating liquid hydrogen cyanide (or ammonium cyanide or a mixture of alkali cyanide and ammonium halide) in liquid ammonia (Japanese Pat. No. 483,920; U.S. Pat. No. 3,287,452). However, this known method is not satisfactory, because the dangerous treatment of poisonous hydrogen cyanide or its salt under a high pressure is necessary and the insoluble colored byproducts, which make the separation and purification of the desired product difficult, are formed in a substantial amount. Further, according to the known method, AD and DCI are usually produced in nearly the same amount and the selective production of one of the compounds is difficult.

3,671,650

CERTAIN 2-(HETEROCYLIC ACYLIMINO)-5-NITRO-4-THIAZOLINE-3-ACETAMIDES

Peter John Islip, Hampton, England, assignor to Parke, Davis & Company, Detroit, Mich.

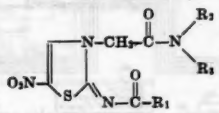
Filed May 14, 1970, Ser. No. 37,295

Claims priority, application Great Britain, June 18, 1969, 30,950/69

Int. Cl. C07d 31/50

U.S. Cl. 260—294.8 D **8 Claims**

5-Nitro-4-thiazoline-3-acetamide compounds having the formula



and salts thereof; where R_1 is 2-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl, or 4-pyridyl, and each of R_2 and R_3 is hydrogen or an alkyl radical containing not more than three carbon atoms. The compounds are produced by reacting a 5-nitrothiazole with an α-haloacetamide and are useful as schistosomacides and trichomonacides.

3,671,651

PEROXY COMPOUNDS CONTAINING A HALOFORMATE GROUP

Antonio Joseph D'Angelo, Buffalo, N.Y., assignor to Pennwalt Corporation

Continuation-in-part of Ser. No. 285,857, June 6, 1963. This application May 7, 1968, Ser. No. 727,323

Int. Cl. C07c 73/10, 73/00; C08f 29/10

U.S. Cl. 260—463 **7 Claims**

A novel class of compounds $X_n—R_p—Y_m$ where R is a 2–4 valence aliphatic, cycloaliphatic or aromatic radical; X is an acylating function; Y is a peroxy containing group and n and m are each equal to 1–2 and p is at least 1.

A novel class of polymers $([A_n-(R-D_n)_l]_v-P)_w^{-z}$ where A is a peroxy containing group; R is a 2–4 valence aliphatic, cycloaliphatic or aromatic radical, P is a polyvalent polymeric residue; D is a carbonyl containing connecting group; Z is H. OH, NH_2, NHR_2, SH or R_3O group; *v* and *w* are each equal to 1–100; and *n* is equal to 1–2.

Polymers II are useful with vinyl monomers in the formation of block and graft polymers.

Peroxides having an acylating function are prepared by reacting at 0°–80° C an organic peroxide having an hydroxyl or carboxyl group with a defined acylating reactant.

Peroxides having at least one acylating function are prepared by peroxidizing a compound having at least two acylating functions as the only peroxidizable substituents.

3,671,652

COREACTED SALTS OF POLYCHLOROCARBOXYLIC ACIDS

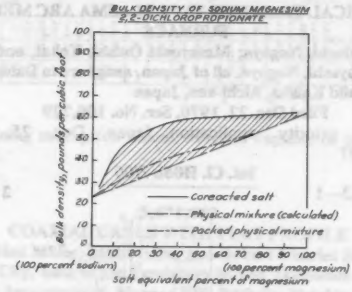
Jaime B. Fernandez, Midland, and James E. Ayers, St. Louis, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 18, 1968, Ser. No. 776,791

Int. Cl. C07c 53/16, 53/32

U.S. Cl. 260—539 R **15 Claims**

Coreacted salts of polychlorocarboxylic acids with alkali metal and alkaline earth metal cations, such as sodium (90) magnesium (10) trichloroacetate or sodium (87.6) calcium (12.4) 2,2-dichloropropionate are prepared by reacting polychlorocarboxylate anion with a mixture of alkali metal and alkaline earth metal cations. The coreacted salts are free flowing crystalline solids with desirable anticaking and high



bulk density properties. The coreacted salts are useful as herbicides.

3,671,653

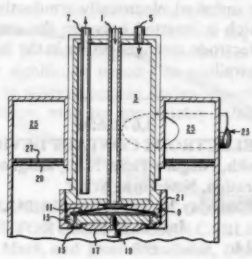
GAS PURGING OF SPINNING PACKS

Walter Cunningham Berry, Jr., Staunton, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 19, 1970, Ser. No. 81,829

Int. Cl. B28b 7/04; D01f 7/00

U.S. Cl. 264—39 **4 Claims**



A process for improving the percentage of successful startups in spinning polymer from solution is provided. Startups are often hindered by the presence of air in the spinneret assembly. The present invention provides for replacing the air in the spinneret assembly with a gas more soluble than air in the solution to be spun.

3,671,654

SYNERGISTIC ANTIBACTERIAL AND ANTIFUNGAL COMPOSITIONS OF DMSO, ETHANOL OR METHANOL AND DIESTER OF 2,2,4-TRIMETHYLPENTANEDIOL-1,3

Heinz Gunter Nosler, Monheim Rhineland, and Hararld Schnegelberger, Hilden Rhineland, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed June 11, 1968, Ser. No. 735,980

Claims priority, application Germany, Dec. 15, 1967, H 64793

Int. Cl. A61k 27/00

U.S. Cl. 424—312 **13 Claims**

Novel antifungal and antibacterial agents having a short-kill time comprising dimethyl sulfoxide, ethanol or isopropanol and an effective amount of at least one diester of 2,2,4-trimethylpentanediol-1,3 and aliphatic carboxylic acids of two to 12 carbon atoms.

ELECTRICAL

3,671,655
ELECTRICAL TRANSFER TYPE PLASMA ARC MELTING FURNACE

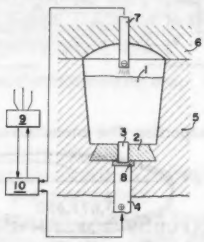
Toshio Adachi, Nagoya; Masayoshi Onishi, Tokai, and Kiyohide Hayashi, Nagoya, all of Japan, assignors to Daido Seiko Kabushiki Kaisha, Aichi-ken, Japan

Filed Dec. 22, 1970, Ser. No. 100,729

Claims priority, application Japan, Dec. 25, 1969, 44/104607

Int. Cl. H05b 7/00

U.S. Cl. 13—1 **2 Claims**



An electrical transfer type plasma arc melting furnace with one or more combined electrodes composed of a metal electrode having direct contact with the scrap or molten metal, a electric carbon electrode directly connected with the source and baked or unbaked electrically conductive compounded refractory which is inserted between the metal bar and the said carbon electrode arranged either in the furnace hearth or in the furnace wall.

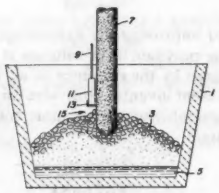
3,671,656
ELECTRODE CONTACT DEVICE

Arthur E. Smith, Niagara Falls, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 17, 1971, Ser. No. 143,955

Int. Cl. H05b 7/10

U.S. Cl. 13—14 **2 Claims**



An electrode contact device for use with metallurgical electric furnaces which comprises a copper body member and a contact member in the form of a powder metallurgical compact consisting essentially of copper and tungsten.

3,671,657
ECHO SYNTHESIZING APPARATUS

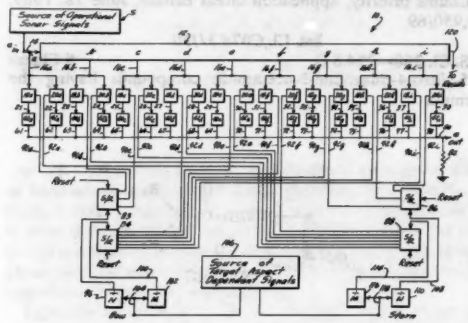
Francis J. Murphree, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 1, 1970, Ser. No. 94,134

Int. Cl. G09b 9/00

U.S. Cl. 35—10.4 **7 Claims**

Echo synthesizing apparatus utilizing a fixed delay line having spaced taps connected to attenuators by gate means which are operated in an aspect dependent manner by shift registers so as to generate across an output resistor a composite echo



signal having aspect dependent highlight characteristics. Embodiments providing also random and/or systematic variations as well as self-showing effects are described.

3,671,658
KEY SWITCH ASSEMBLY FOR ELECTRONIC MUSICAL INSTRUMENTS

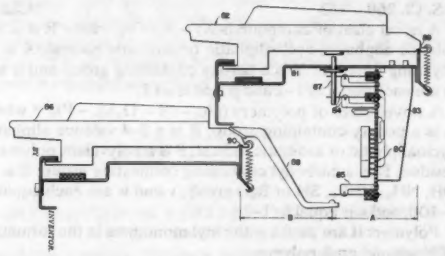
Junji Ohno, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed June 30, 1970, Ser. No. 51,106

Claims priority, application Japan, July 1, 1969, 44/62616

Int. Cl. G10h 1/00

U.S. Cl. 84—1.01 **3 Claims**



A key switch assembly for electronic musical instruments wherein there is mounted a printed circuit board close to the undersides of a row of parallel-arranged keys, the board being fitted with various circuit elements constituting a circuit for producing musical tones and also with a plurality of switch means operated by the corresponding key adjacent thereto through an actuator.

3,671,659
PLURAL TONE SELECTOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Syoichi Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed April 2, 1971, Ser. No. 130,602

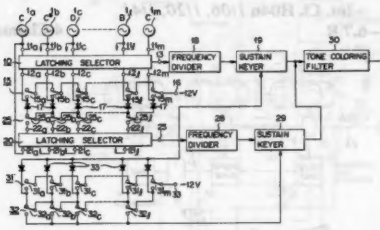
Claims priority, application Japan, April 6, 1970, 45/32592

Int. Cl. G10h 3/06

U.S. Cl. 84—1.17 **7 Claims**

A plural tone selector for an electronic musical instrument comprises first and second latching selectors each having a

plurality of input terminals supplied with tone signals of different pitches, a plurality of control terminals corresponding to the input terminals and one common output terminal. A plurality of key switches are provided for causing one of the plural control terminals of the first and second latching selectors respectively to be impressed with control voltage to selectively derive from the common output terminals of the first

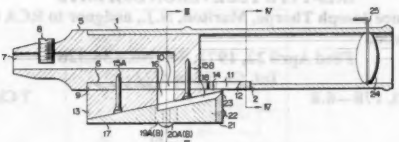


and second latching selectors two tone signals supplied to the input terminals thereof corresponding to the control terminals upon the selective actuation of the key switches due to key depression. The derived tone signals are supplied to first and second sustain keyers, respectively, which are conducted by control voltage impressed by other key switches actuated upon key depression.

3,671,660
BAMBOO ORGAN PIPE ASSEMBLY

Hidehiko Kita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Feb. 18, 1971, Ser. No. 116,485
Claims priority, application Japan, Feb. 23, 1970, 45/17134
Int. Cl. G10b *3/08*
U.S. Cl. 84—349 **12 Claims**



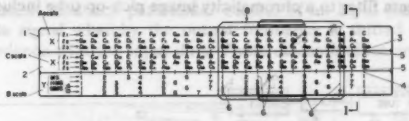
A bamboo organ pipe assembly including a foot airtightly inserted into a bamboo tubular pipe, the foot having an air passage formed therein for directing air supplied from the outer end thereof toward a peripheral portion of the pipe, and wherein there is fixed on the peripheral portion of the pipe a member having a recess therein communicating with the air passage of the foot for receiving the air therefrom. The bamboo tubular pipe is provided with a mouth or aperture through a peripheral portion thereof adjacent the inner end of the foot inserted thereinto, and the recess formed in the member terminates in a slit defined by a languid and a lower lip, the slit being adapted to direct a sheet of air toward a peripheral edge of the mouth of the tubular pipe to produce a tone. The member preferably is formed of a pair of tapered boards, one of which is slidable relative to the other, and the tubular pipe preferably has an adjustable vane therein for adjusting the pitch of the tone.

3,671,661
METHOD OF DETERMINING PITCH NAMES IN VARIOUS KEYS AND PITCH NAME DETERMINING SLIDE RULE

El Yoshida, 21 Ikedamachi 5-chome, Omihachiman-shi, Japan

Filed Dec. 26, 1968, Ser. No. 787,189
Claims priority, application Japan, Dec. 30, 1967, 43/5303
Int. Cl. G09b *15/02*
U.S. Cl. 84—473 **10 Claims**

A method of theoretically determining musical scales, chords and pitch names of transposition in various musical keys, and a music slide rule of the hand operated type for

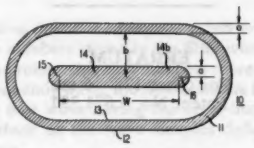


determining such pitch names which is capable of using said method.

3,671,662
COAXIAL CABLE WITH FLAT PROFILE

Calvin Max Miller, Millersville, and Robert Charles Sacks, Ellicott City, both of Md., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 16, 1970, Ser. No. 98,787
Int. Cl. H01b *9/04*
U.S. Cl. 174—28 **6 Claims**



A flattened coaxial cable structure has been found to exhibit advantages over conventional circular coaxial structures for some applications. This structure is a bifurcated conventional coaxial cable with the two semicircular segments joined by flat solid metal. A wide range of impedances can be realized without any significant penalty in added loss. Furthermore, tolerances to achieve certain design objectives, such as attenuation deviation, may be appreciably relaxed with the new structure.

3,671,663
CONDUCTIVE THERMOPLASTIC COMPOSITION USEFUL FOR HIGH TENSION CABLES

Friedrich Seifert, Marl, and Josef Bittscheidt, Datteln, both of Germany, assignors to Chemische Werke Huels, A.G., Marl, Germany

Filed March 25, 1970, Ser. No. 22,672
Claims priority, application Germany, March 25, 1969, P 19 15 061.9
Int. Cl. H01b *7/02*
U.S. Cl. 174—120 SC **11 Claims**

The invention relates to electrically conductive thermoplastic compositions suitable for use as intermediate layers in high tension cables having an outer insulating layer comprising poly (butene-1). The composition comprises stated amounts of isotactic poly (butene-1), amorphous and/or atactic thermoplastic compositions, and an electrically conductive carbon black.

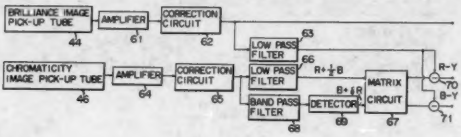
3,671,664
COLOR TELEVISION IMAGE PICK-UP DEVICES

Hisao Tajiri, Sagamihara-shi; Ituzo Sato; Yasuo Takemura, both of Kawasaki-shi, and Shigeo Tsuji, Fujisawa-shi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 14, 1968, Ser. No. 775,825
Claims priority, application Japan, April 19, 1968, 43/25446; Nov. 16, 1967, 42/73370; Nov. 27, 1967, 42/75641; Nov. 14, 1967, 42/72767
Int. Cl. H04n *9/08*
U.S. Cl. 178—5.4 ST **4 Claims**

In a color television image pick-up device the light received

through an objective lens is divided to follow two discrete paths, a part of the light being supplied to a brilliance image pick-up and the other part of the light being supplied through a Magenta filter to a chromaticity image pick-up tube including a stripe filter formed on the inner surface of a face plate and consisting of alternate monochromatic portions of red or blue color and transparent portions, thus obtaining color television signals from the output from two image pick-up tubes.



ERRATUM

For Class 178—6 see:
Patent No. 3,671,391

3,671,665

SIGNAL EDITING SYSTEM AND APPARATUS FOR RECORDING AND REPRODUCING APPARATUS

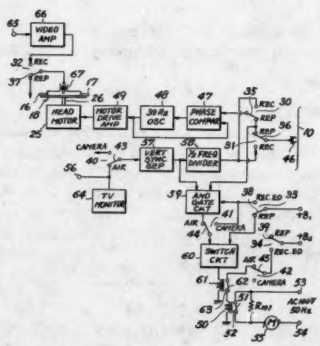
Yoshiteru Kosaka, Kamakura, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Kanagawta-ken, Japan

Continuation-in-part of Ser. No. 778,666, Nov. 25, 1968, Pat. No. 3,580,994. This application June 30, 1970, Ser. No. 51,103

Claims priority, application Japan, Nov. 27, 1967, 42/75626; Nov. 27, 1967, 42/75627; July 2, 1969, 44/51743

Int. Cl. G11b *5/04, 27/02*; H04n *5/78*

U.S. Cl. 178—6.6 P 3 Claims



A signal editing system edits and records a new signal on the way of an already recorded signal on a recording medium in a recording and reproducing apparatus. Editing and recording are started and ended respectively at the time when a control signal already recorded on the recording medium and a control signal responsive to the new recording signal become coincident each other at the starting and ending time of editing and recording.

3,671,666

APPARATUS FOR PRODUCING CORRECTED PHOTOGRAPHIC COLOR RASTERED REPRODUCTIONS

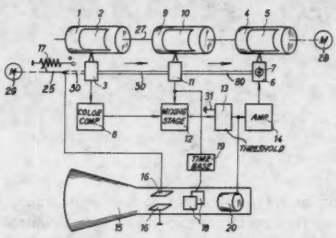
Eberhard Hennig, Ascheberg, Germany, assignor to Rudolf Hell Kommanditgesellschaft

Filed Feb. 18, 1969, Ser. No. 800,072

Claims priority, application Germany, Feb. 22, 1968, P 16 22 336.2

Int. Cl. H04n *1/06, 1/20, 1/41*

U.S. Cl. 178—6.7 R 4 Claims



A method and apparatus for producing a color corrected and rastered reproduction wherein a continuous tone picture is photoelectrically scanned and combined with the output of a second scanning head which scans a raster pattern to be superimposed over the picture and the outputs of the two heads are combined and applied to a recording head through a threshold circuit.

A cathode ray tube is provided for allowing the method to be monitored so as to assure that the proper reproduction is occurring.

3,671,667

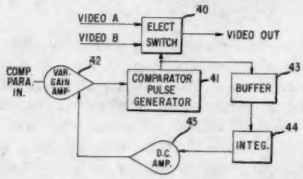
SPECIAL EFFECTS GENERATORS FOR PROVIDING IRIS-TYPE TELEVISION DISPLAYS

Laurence Joseph Thorpe, Marlton, N.J., assignor to RCA Corporation

Filed April 22, 1971, Ser. No. 136,326

Int. Cl. H04n *5/22*

U.S. Cl. 178—6.8 7 Claims



A special effects generator employs an electronic switch controlled by a comparator which operates to provide a series of pulses of varying durations to control the switch in a manner to produce a single video signal containing a plurality of different video signals to be displayed simultaneously in an iris display.

A feedback scheme permits the comparator to provide greater selectivity for enabling the generator to provide smaller diameter iris displays.

3,671,668

TEACHING SYSTEM EMPLOYING A TELEVISION RECEIVER

Leonard Reiffel, 62 East Division, Chicago, Ill.

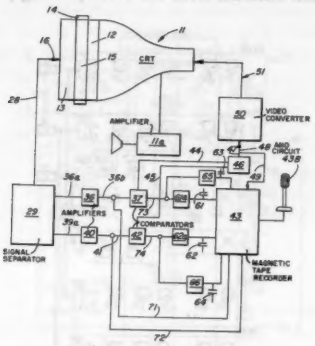
Continuation-in-part of Ser. No. 720,130, April 10, 1968, abandoned. This application Nov. 18, 1968, Ser. No. 776,723

Int. Cl. H04n *7/18*

U.S. Cl. 178—6.8 5 Claims

An electronic audio-visual teaching system employing essentially a cathode ray tube and associated electronic ap-

paratus and a transparent manually operated spatial response signal generator which coacts with the cathode ray tube



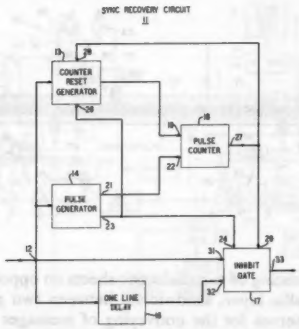
whereby feedback between students and teaching machine is readily achieved. Provides considerable ease in programming. Also can be used for remote polling of viewers.

3,671,669

RECOVERY OF HORIZONTAL SYNC PULSES FROM A COMPOSITE SYNCHRONIZING FORMAT

Robert Plowden Abbott, Freehohd, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkely Heights, N.J.

Filed Dec. 14, 1970, Ser. No. 97,567
Int. Cl. H04n *5/10*
U.S. Cl. 178—7.3 S **6 Claims**



A synchronizing circuit of a video receiver removes the vertical synchronizing pulses from a composite synchronizing pulse waveform that contains both vertical and horizontal synchronizing pulses. A counter in the synchronizing circuit anticipates the occurrence of a vertical synchronizing pulse by counting the number of horizontal synchronizing pulses and removing the vertical synchronizing pulse to substitute a delayed horizontal synchronizing pulse. The circuit synchronizes within one video frame upon start-up and will not allow any lock-out condition to exist for more than one frame.

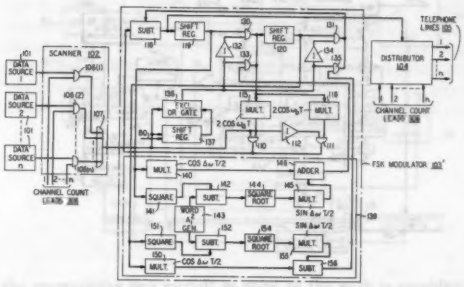
3,671,670

DIGITAL FILTER FREQUENCY-SHIFT MODULATOR

Burton R. Saltzberg, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 15, 1970, Ser. No. 28,872
Int. Cl. H04l *27/12*; H04b *1/04*
U.S. Cl. 178—67 **11 Claims**

Unity gain feedback places a second-order digital filter on the borderline of stability. The filter therefore oscillates in a numerical sense. Two feedback multipliers, each capable of determining a different central coefficient (and thus different oscillation frequencies) are alternatively inserted into an independent feedback path under control of an input baseband data signal whereby the output frequency is shifted in accordance with the input data. Phase discontinuities and amplitude variations due to the frequency shift are eliminated by extracting the numbers stored in the filter when a data transition occurs and reinserting new numbers representing samples of the new frequency wave, the new numbers further defining points on the new wave having the same instantaneous amplitude and phase as the wave samples defined by the extracted numbers.

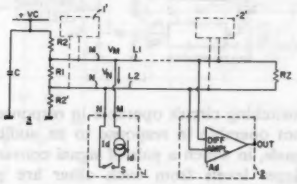


3,671,671

PULSE TRANSMITTING AND RECEIVING SYSTEMS

Kazutaka Watanabe, Toyko, Japan, assignor to Yokogawa Electric Works, Ltd., Toyko, Japan

Filed June 10, 1970, Ser. No. 44,944
Claims priority, application Japan, June 13, 1969, 44/46551
Int. Cl. H04l *25/00*
U.S. Cl. 178—68 **5 Claims**



A pulse transmitting and receiving system comprises a transmission circuit including a balanced pair transmission line, impedances having the same characteristic impedance as the transmission circuit and connected on the opposite ends thereof, a pulse transmission circuit connected across the transmission lines so as to cause currents of equal magnitude but of opposite polarities to flow through transmission lines and a pulse receiving circuit including a differential amplifier responsive to the variation in the potentials of the transmission lines caused by the flow of the currents.

3,671,672

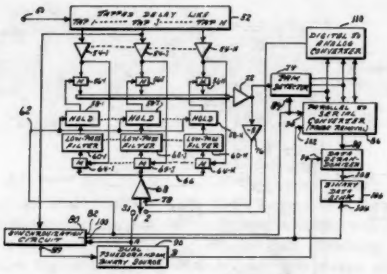
AUTOMATIC CHANNEL EQUALIZATION APPARATUS WITH DATA EQUALIZATION MODE ADAPTOR

Harold G. Sullivan, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Feb. 18, 1971, Ser. No. 116,363
Int. Cl. H04l *25/02*
U.S. Cl. 178—69 A **1 Claim**

Apparatus for automatically equalizing a data channel while data is being transmitted therethrough. This is accomplished

by using the data itself, which is randomized, to adjust the receiving apparatus to reduce or eliminate the degrading effects of channel induced inter-symbol interference upon the reception of multilevel pulse amplitude or pulse mode modulation.



High data transmission rates are achieved by switching to a data equalization mode of operation following a training period in the conventional system probe equalization mode.

3,671,673

SIGNAL SWITCHING CIRCUIT OPERABLE IN RESPONSE TO A VOICE SIGNAL

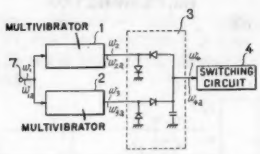
Kozo Uchida, Nishitama, and Toshiyuki Tsuji, Kokubunji, both of Japan, assignors to Iwasaki Tsushinki Kaisha (also known as Iwatsu Electric Co., Ltd.), Tokyo, Japan

Filed April 6, 1971, Ser. No. 131,756

Claims priority, application Japan, April 8, 1970, 45/29397

Int. Cl. G10l *1/04*

U.S. Cl. 179—1 VC **5 Claims**



A signal switching circuit operable in response to a voice signal but not operable in response to an audible periodic signal or signals, in which a pair of signal convertors having different trigger levels from each other are provided to generate a first pulse train and a second pulse train in response to respective intersections of the instantaneous level of the voice signal with the different trigger levels. A switching circuit is switched to a desired state when a difference between respective number of pulses of the first pulse train and the second pulse train reaches a predetermined value.

3,671,674

CIRCUIT ARRANGEMENT FOR THE RECEPTION AND FORWARDING OF MESSAGE SIGNALS IN TIME DIVISION MULTIPLEX EXCHANGE STATIONS

Karl-Anton Lutz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

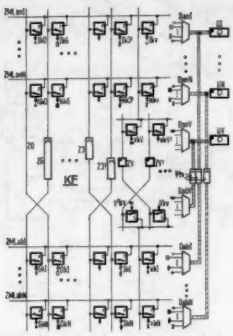
Filed Sept. 14, 1970, Ser. No. 71,655

Claims priority, application Germany, Sept. 16, 1970, P 19 46 883.8

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 AT **2 Claims**

A circuit arrangement for telecommunication exchange installations is described wherein connections are completed utilizing time multiplex techniques. In the described embodiment the message signals are PCM signals, and transmissions take place over four-wire networks. Delay is introduced into the connection elements between arriving and departing lines so that pulse frames of departing transmission lines have a time position different from the corresponding pulse frames for arriving lines. A common address store is provided for approaching coupling point switches over which a connection may be made to each given transmission line.



3,671,675

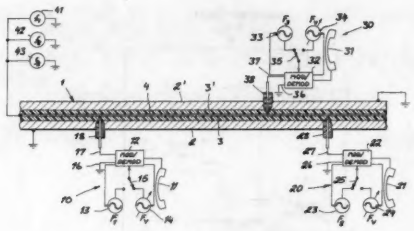
HIGH-FREQUENCY COMMUNICATION SYSTEM

Thomas I. Ress, 8245 Baldwin Circle, Buena Park, Calif.

Filed June 17, 1969, Ser. No. 834,100

Int. Cl. H04j *1/00*

U.S. Cl. 179—15 FD **12 Claims**



A panel consisting of two dielectric sheets on opposite sides of a thin metallic layer, sandwiched between two grounded metal plates, serves for the conveying of messages between several transmitting and receiving stations operating on different carrier frequencies. A station can be plugged in, for transmission or reception, at virtually any location along the panel by insertion of a probe through the proximal dielectric sheet; communication is thus possible between stations on either side of the panel.

3,671,676

SUBSCRIBER LOOP RANGE EXTENDER

James L. Henry, and Luther G. Schimpf, both of Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

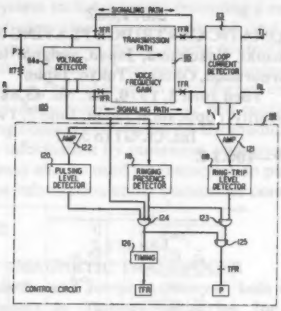
Filed Dec. 17, 1969, Ser. No. 885,949

Int. Cl. H04g *1/30*

U.S. Cl. 179—16 F **9 Claims**

This disclosure describes a telephone subscriber loop range extender having a signaling mode and a transmission mode. In the former, a resistive shunt is applied across the loop with each dial pulse to aid operation of the pulsing relay for an originating cell. For a terminating call, the shunt is applied upon answer, either during ringing or during the silent interval, to aid operation of the ring-trip relay. In the transmission

mode, voice frequency gain and greater transmitter voltage are applied to the loop. A control circuit consisting of logic, timing and relay driving circuits, acts upon loop voltage and current data to control shunt action and mode selection.



3,671,677

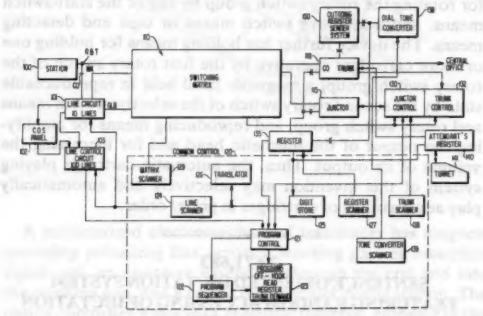
OUTGOING REGISTER SENDER SYSTEM

Ernest O. Lee, Jr., and John A. Adams, Jr., both of Fairport, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed July 23, 1970, Ser. No. 57,550

Int. Cl. H04m *3/38*

U.S. Cl. 179—18 DA **57 Claims**



An outgoing register sender system, which is capable of receiving and storing dialed digits for outpulsing to a central office, includes a register sender which may be selectively associated with a central office trunk for the duration of the outpulsing operation, a tone dial converter and a digit analyzer and decoder arrangement to provide toll restriction, the digit analyzer and decoder arrangement being provided on a time share basis so as to be available for use with a plurality of register senders.

3,671,678

RINGING CONTROL CIRCUIT

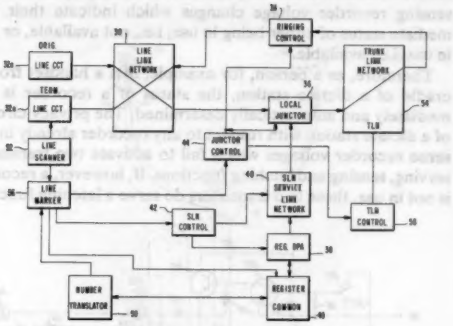
Otto Altenburger, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 22, 1970, Ser. No. 100,647

Int. Cl. H04m *3/02*

U.S. Cl. 179—18 HB **20 Claims**

A ringing control circuit is provided in each terminating line between the trunk link network and the line link network so that once a path to the terminating line circuit is established, the ringing control is automatically available as a result of its being a part of this connection. In addition, a splash ring circuit in the ringing control provides for an immediate ring of the terminating line circuit as soon as the path is established thereto.



3,671,679

ARRANGEMENT FOR THE RECOGNITION OF LOOP CLOSURE IN SUBSCRIBER STATIONS HAVING SEMICONDUCTOR AMPLIFIERS FED VIA THE CONNECTING TRUNK

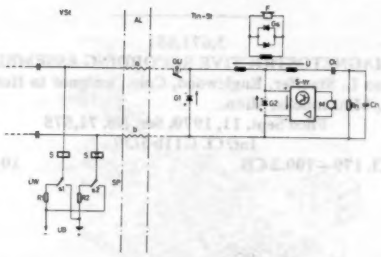
Hans Ulrich Knauer, Ludwigsburg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 18, 1969, Ser. No. 877,806

Claims priority, application Germany, Dec. 7, 1968, P 18 13 347.6

Int. Cl. H04m *3/40, 19/00*

U.S. Cl. 179—81 B **6 Claims**



An arrangement is provided for the recognition of call initiating loop closure in telephone subscriber stations employing semi-conductor amplifiers fed over a connecting trunk. On loop-closure, there is first created a virtual short circuit in the supervisory current direction. After recognition, the exchange switches over to the feed current direction for the amplifiers in the subscriber station. In this way the loop closure criterion is made independent of the d-c resistance of the amplifiers.

3,671,680

PRIVACY OF DICTATE STATIONS USING A RECORDER AND SELECTION OF RECORDERS BY DICTATE STATIONS WHILE MAINTAINING PRIVACY

William M. Nye, Bellevue, and Stanley W. Jones, Seattle, both of Wash., assignors to Lanier Electronic Laboratory, Inc., Atlanta, Ga.

Filed Aug. 11, 1969, Ser. No. 849,026

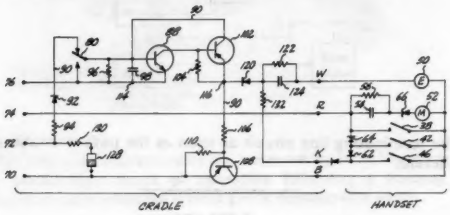
Int. Cl. G11b *19/00*; H04m *11/10*

U.S. Cl. 179—100.1 DR **15 Claims**

Persons are able to dictate promptly and privately using dictate stations which are connected to one or more recorders.

Circuits, incorporating transistors and preferably physically located within a dictate station, assure privacy and/or select a recorder quickly. These additional control circuits for privacy and/or selection constantly monitor recording operations by sensing recorder voltage changes which indicate their immediate status of either being in use, i.e., not available, or not in use, i.e., available.

Therefore, as a person, for example, lifts a handset from a cradle of a dictate station, the status of a recorder is immediately and automatically determined. The privacy circuits of a dictate station with respect to any recorder already in use sense recorder voltages which fail to activate two transistors serving, sensing and latching functions. If, however, a recorder is not in use, these two transistors do serve a latching function



and switch on a third transistor for entry into a particular recording circuit.

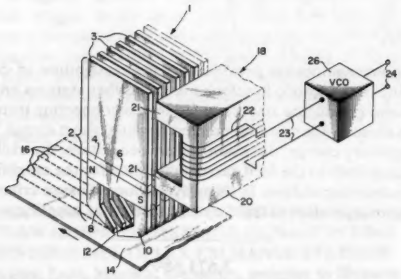
Where additional recorders may be available, additional selector sensing and latching transistors and their related circuits are utilized with the privacy transistors in immediately and automatically selecting one of the available recorders. As the transistor latching and switching on occurs in privately connecting a respective dictate station to a respective recorder, additional interrelated privacy and selection transistors and their circuits function together to prevent any interference with this connection thereby assuring privacy of the dictation as it is recorded.

3,671,681

MAGNETOSTRICTIVE RECORDING ASSEMBLY

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 11, 1970, Ser. No. 71,575
Int. Cl. G11b *5/30*
U.S. Cl. 179—100.2 CH **10 Claims**



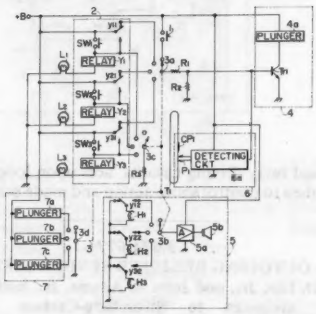
A magnetic recording head assembly for recording input signals by selectively energizable recording heads on respective recording tracks on a recording member. The head assembly includes a plurality of recording heads with each of the recording heads having a frequency resonant structure including a magnetostrictive element accoustically coupled to a pair of pole pieces defining a recording gap and having a permanent magnet associated therewith for producing a magnetic flux through said gap. An input means including an electromagnet energized by an input signal source is arranged to apply a time varying electromagnetic field concurrently to the magnetostrictive element of each of the recording heads.

3,671,682

AUTOMATIC CARTRIDGE PLAYING SYSTEM

Tsutomu Suzuki, Yokohama, Japan, assignor to Pioneer Electronic Corporation, Ohtaku, Tokyo, Japan

Filed June 5, 1970, Ser. No. 43,882
Claims priority, application Japan, June 7, 1969, 44/44797
Int. Cl. G11b *5/02*
U.S. Cl. 179—100.2 Z **5 Claims**



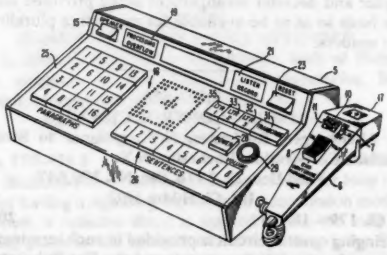
An automatic cartridge playing system which has a start-switch means, a selective switch means for selecting in advance a predetermined cartridge, and a tape end detecting means for detecting the end of a magnetic tape. The device also has a rotary switch group, a rotary switch rotating means for rotating the rotary switch group by any of the start-switch means, and a selective switch means or tape end detecting means. The device further has holding means for holding one or more cartridges operative by the first rotary switch of the rotary switch group, a magnetic head held in reproduceable state by the second rotary switch of the selective switch means and rotary switch group, and reproducing means for amplifying the output of the magnetic head and for increasing the volume of its output. Thus, the automatic cartridge playing system of this invention may selectively and automatically play any cartridge or cartridges in preset order.

3,671,683

SENTENCE ORIENTED DICTATION SYSTEM FEATURING RANDOM ACCESSING OF DICTATION SEGMENTS

Robert A. Rahenkamp, and William R. Stewart, Jr., both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1970, Ser. No. 50,605
Int. Cl. G11b *15/02, 27/08*
U.S. Cl. 179—100.2 MD **2 Claims**



The present invention concerns a system for recording audio signals on a record medium cooperating with a trans-

ducer means, with the record media having a plurality of segment storage areas, such as individual storage areas on a tape, belt or card, or the like, and with storage of information taking place on a sentence, paragraph, or letter basis under dictator control. The system includes means mounting a record medium for transducing operations to record and reproduce signals, a microphone input means having control buttons and a separate control panel with provision for random selection of signal tracks on the medium. In a preferred embodiment, the system includes a magnetic tape or belt medium recording-reproducing console with tracks on the medium arranged to store audio information by sentences, paragraphs, and letters. The unit may also be used for transcription purposes with accessing of the information under transcriber control.

3,671,684

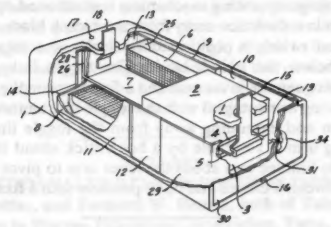
MAGNETIC TRANSDUCER

George C. Tibbetts, and Joseph A. Sawyer, both of Camden, Maine, assignors to Tibbetts Industries, Inc., Camden, Maine

Continuation of Ser. No. 10,093, Feb. 16, 1970, abandoned, which is a continuation of Ser. No. 638,892, May 16, 1967, abandoned. This application Nov. 6, 1970, Ser. No. 87,629

Int. Cl. H04r *9/02*

U.S. Cl. 179—117 **22 Claims**



A miniaturized electromechanical transducer has magnets providing polarizing flux across a working gap, an electrical signal coil, an armature extending through the coil and into the working gap, and a casing of particular configuration. The casing comprises a sleeve of magnetic material, elongate in the direction of its axis, which substantially surrounds the armature, coil, and magnets, said sleeve providing a substantially uninterrupted high permeability path between the magnets.

3,671,685

ELECTRO-ACOUSTIC HEADSET WITH RATCHET

John P. McCabe, Miller Place, N.Y., assignor to Instrument Systems Corporation, Jericho, N.Y.

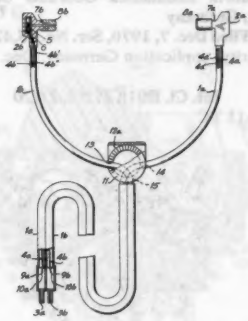
Filed Nov. 9, 1970, Ser. No. 87,692

Claims priority, application Germany, Jan. 25, 1969, P 19 03 794.6

Int. Cl. H04m *1/05*; H04r *5/00*

U.S. Cl. 179—156 **10 Claims**

A headset incorporating a tubular conductor for sound waves having an earpiece at one end and a connector at the other, and electrical conductor means for coupling said connector to an electro-acoustic transducer mounted within said earpiece. The headset is preferably provided with a pair of earpieces, each connected by a tubular sound wave conductor and electrical conductor means to a respective connector. The pair of tubular sound conductors are joined at a junction means at a point therealong spaced from said earpieces, said junction means including a pair of support members, each receiving one of said sound wave conductors and being



adapted for relative angular displacement for the selective positioning of the earpieces by the user.

3,671,686

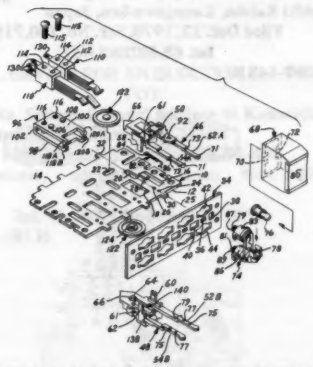
PUSH BUTTON SWITCH ASSEMBLY WITH IMPROVED DISCRETE AND IDENTICAL GEOMETRIC SHAPED INTERLOCKING SLIDER MEANS

Walter C. Sadogierski, Park Ridge, Ill., assignor to Guardian Electric Manufacturing Company

Filed Nov. 9, 1970, Ser. No. 88,018

Int. Cl. H01h *9/26*; G05g *1/00*

U.S. Cl. 200—5 EA **23 Claims**

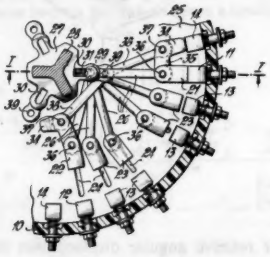


An improved push button switch includes a single body plate with assembled push rods or actuators fastened to the single body plate and cooperable with moving disc members, a ratchet and spring, or biasing means. The disc members are held in position by a bracket, the bracket also being fastened to the single body plate. Contact blocks are fastened to the outside of the bracket and cooperate with assembled contact cam block members of the push rods or actuators. Biasing leaf springs of the contact blocks cooperate with the actuators to facilitate switching action. A push button fastens to the end of the actuators to secure alignment of the actuators through a front plate of the switch and provide a manual interface to the operator.

3,671,687
TRANSFER SWITCH FOR TAP-CHANGING REGULATING TRANSFORMERS INCLUDING LOST MOTION INTERCONNECTION DRIVING MECHANISM

Alexander Bleibtreu, Regensburg, Germany, assignor to Maschinenfabrik Reinhausen Gebruder Scheubeck K.G., Regensburg, Germany

Filed Dec. 7, 1970, Ser. No. 95,428
Claims priority, application Germany, Dec. 16, 1969, P 19 62 958.4
Int. Cl. H01h 21/38, 21/20
U.S. Cl. 200—11 TC 6 Claims

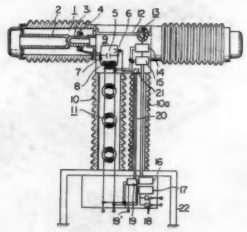


In a polyphase transfer switch for tap-changing regulating transformers the cooperating fixed and movable contacts of each phase are arranged to form a pattern in the shape of a sector of a circle. The movable current-carrying contacts are hingedly supported by the movable main contacts. Due to the presence of a lost motion connection the current-carrying contacts are separated prior to separation of the main contacts, and on account of this lost motion connection cooperating current carrying contacts are brought into engagement only after the main contacts are brought into engagement.

3,671,688
POWER CIRCUIT BREAKER

Yoshio Nitta, Kawasaki, Japan, assignor to Fuji Denki Seizo Kabushiki Kaisha, Kanagawa-ken, Japan

Filed Dec. 22, 1970, Ser. No. 100,719
Int. Cl. H01h 33/82
U.S. Cl. 200—48 R 1 Claim

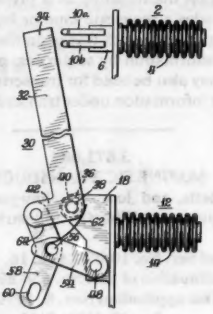


An improved power circuit breaker comprising a pair of electrodes which are to be broken in the case of accidental trouble ; a condenser ; an electromagnetic coil coupled electromagnetically with an electrode of said pair electrodes, opening of said electrodes being attained by discharging charged energy of said condenser into said electromagnetic coil ; and an electromagnetic wave generating device provided at a high potential part ; in which said electromagnetic wave is passed through interior of a support insulator, and electric energy necessary for operating said electromagnetic wave generating device is supplied from a power source for charging said condenser, whereby an electromagnetic wave corresponding to line current is produced at a high potential part and said wave is converted to an electric signal by means of a receiver provided at an earth potential part, thus introducing said signal to various control devices.

3,671,689
DISCONNECT SWITCH

Vincent G. Falvo, Pittsburgh, Pa., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 7, 1971, Ser. No. 104,579
Int. Cl. H01h 31/00
U.S. Cl. 200—48 A 6 Claims

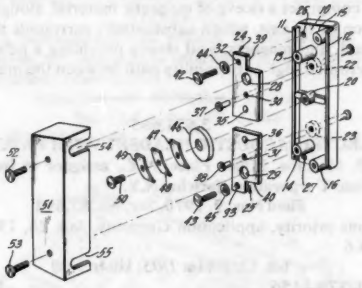


A disconnect switch is disclosed which may be mounted in a vertical or underhung position and operated from below. The disconnect switch includes a switch blade having a pivoting end and a laterally extending lever arm at the pivoting end. A toggle linkage operating mechanism is positioned opposite the lever arm in a direction away from the switch blade. When the disconnect switch is positioned vertically, the toggle linkage will be below the switch blade. The toggle linkage is connected between the lever arm and a fixed terminal pad and has an operating arm integral with the toggle link connected to the lever arm and extending away from the toggle linkage. The operating arm is rotatable by a hook stick about the knee of the toggle linkage and about the lever arm to pivot the switch blade between a closed and open position with a fixed contact.

3,671,690
VIBRATING SWITCH

Philip J. Parlato, Kings Park, N.Y., assignor to Alarm Products International, Inc., Long Island City, N.Y.

Filed March 16, 1971, Ser. No. 124,791
Int. Cl. H01h 35/14
U.S. Cl. 200—61.45 R 7 Claims



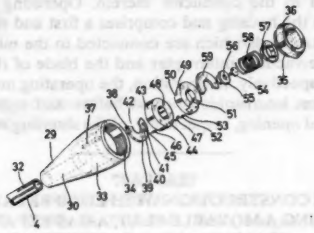
A switch which is operable responsive to impact comprises a ring-shaped contact biased into bridging contact with spaced stationary contacts. The ring-shaped contact is rotatable relative to the spaced contacts to present new contacting surfaces upon rotation, and is biased toward the stationary contacts by the pressure of leaf springs pressed against the ring contact by an adjustable screw which passes through the center of the contact.

3,671,691

MULTIPLE SWITCH CONSTRUCTION

Masaru Suzuki, Aichi-ken, and Yukinobu Murakami, Hiroshima, both of Japan, assignors to Kabushiki Kaisha, Tokai Rika Denki Seisakusho, Aichi-ken, Japan

Filed Dec. 4, 1970, Ser. No. 95,119
Int. Cl. H01h 9/00
U.S. Cl. 200—61.54 5 Claims



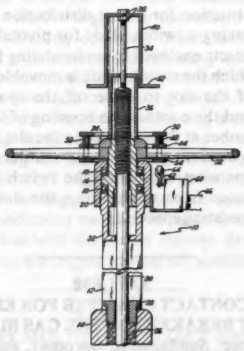
A multiple switch construction particularly for use in automotive vehicles or the like having a plurality of switches, for example, for operating a head-light controlling device, a windshield wiper, a windshield washer and a turn indicator device. Of which, two switches are housed in the steering column and the remaining two switches are accommodated in a handle mounted on a free end of a lever of which the other end is drivingly associated with said first mentioned two switches. These switches can be operated by turning the lever in the direction parallel to the plane of the steering wheel, shifting the lever in the direction at right angles to the plane of the steering wheel, turning the handle in the circumferential direction with respect to the lever and/or pushing the handle in the axial direction with respect to the lever.

3,671,692

RISING STEM VALVE REMOTE POSITION INDICATOR

Jack D. Potter, and Bernard W. Reems, both of Tulsa, Okla., assignors to Warren Petroleum Corporation, Tulsa, Okla.

Filed June 7, 1971, Ser. No. 150,363
Int. Cl. H01h 9/06
U.S. Cl. 200—61.86 7 Claims



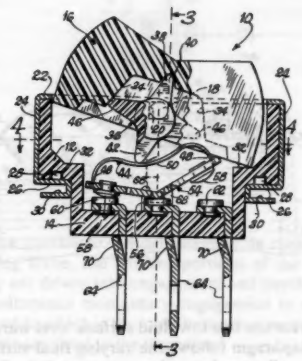
A rising stem valve position indicator having a sleeve mounted on the handwheel of the valve extending upwardly a distance adequate to enclose the valve stem when the valve is in the full open position. A rod extends from the end of the valve stem through the sleeve to support a sleeve cover that moves down over the sleeve to cover it when the valve is closed. Downward movement of the cover on closing the valve depresses an upwardly biased ring to close a switch and actuate a signal indicating the valve is closed.

3,671,693

ROCKER SWITCH

Guy M. Farrell, Elmhurst, Ill., assignor to Chicago Switch, Inc., Chicago, Ill.

Filed May 28, 1971, Ser. No. 147,819
Int. Cl. H01h 13/28
U.S. Cl. 200—67 G 8 Claims



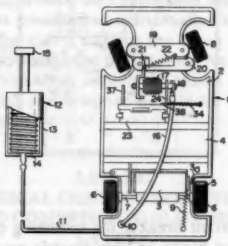
A switch construction comprising a base carrying at least two stationary contacts with a movable contact arm being disposed over said base for engaging the stationary contacts. A spring is positioned on the contact arm, and this spring includes downwardly depending end portions connected to the ends of the arm and a central portion spanning the arm. A star wheel is located within a rocker used for operating the switch. One point of the star wheel engages the spring, and an opposite point engages the rocker. Additional intermediate points of the star wheel alternately engage interior wall portions defined by the rocker. The structural combination provides an easily assembled and highly effective over-center rocker switch.

3,671,694

CONTROL DEVICE FOR AN ELECTRICALLY DRIVEN TOY

Yukio Masuda, Saitama, Japan, assignor to Kabushiki Kaisha Okuma Seisakusho, Saitama-ken, Japan

Filed Nov. 25, 1970, Ser. No. 92,802
Claims priority, application Japan, Nov. 27, 1969, 44/112130
Int. Cl. H01h 35/32; A63h 30/00
U.S. Cl. 200—81 H 5 Claims



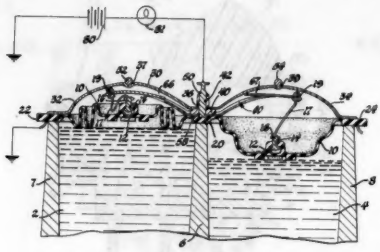
A control device for an electrically driven toy so improved as to facilitate its remote control by an operator wherein the steering and switching mechanisms for controlling the advance, retreat and stop of said toy can be effected by a single control device using air pressure.

3,671,695

BRAKE FLUID LEVEL SENSOR

Douglas J. Wing, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed April 24, 1970, Ser. No. 31,678
Int. Cl. H01h *35/18*
U.S. Cl. 200—84 R **1 Claim**



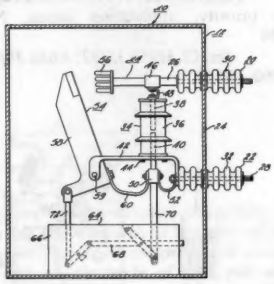
A switch for use in a low fluid surface level warning system. A sealed diaphragm follows the varying fluid surface level. A string-like pull member whose one end is fixed to the diaphragm has its other end fixed to the free end of a leaf spring member of concavo-convex cross-section and of greater rigidity near its fixed end than its free end. Near the free end of the leaf spring member is an electrically conducting tongue extending toward the fixed end. As the liquid surface falls the string-like pull member forces the leaf spring member to bend near its free end until it snaps through and projects the tongue against another contact to complete an actuating circuit for a warning device.

3,671,696

VACUUM INTERRUPTER SHUNTED WITH MECHANICAL SWITCH

Richard G. Brunner, Dedham, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 16, 1970, Ser. No. 89,893
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **1 Claim**



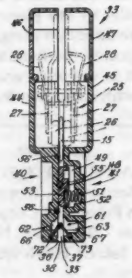
An electric circuit breaker for switching capacitive loads, such as capacitor banks or long electric power transmission lines, comprises a metallic housing having a pair of spaced apart terminal bushings extending through the wall thereof. Each bushing comprises a conductor and an insulator. A vacuum interrupter comprising an evacuated envelope and a stationary and a movable contact therein is mounted in the housing between the bushings and each contact is connected to the conductor in a respective bushing. A shunting switch for parallel connection with the vacuum interrupter is mounted in the housing between the bushings. The shunting switch has less current interrupting capacity but greater current carrying capacity than the vacuum interrupter. The shunting switch comprises a stationary contact which is mounted on one bushing and electrically connected to the conductor therein. The shunting switch further comprises a pivotable blade type contact which is mounted on the other bushing and electrically connected to the conductor therein. Operating means are located in the housing and comprises a first and second insulated contact rods which are connected to the movable contact of the vacuum interrupter and the blade of the shunting switch, respectively. In operation, the operating means causes the vacuum interrupter to close before and open after the closing and opening, respectively, of the shunting switch.

3,671,697

SWITCH CONSTRUCTION WITH LOAD BREAK DEVICE HAVING A MOVABLE SLAT, A GAS EXPANSION CHAMBER AND A GAS MUFFLER

Robert H. Harner, Park Ridge, and Otto Meister, Evanston, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Jan. 7, 1971, Ser. No. 104,589
Int. Cl. H01n *33/08*
U.S. Cl. 200—144 R **11 Claims**



Switch construction for power distribution alternating current circuits having a switch blade for pivotal movement into and out of contacts enclosed by an insulating housing having a slot through which the switch blade is movable. A slat is biased transversely of the slot to close off the space between the switch blade and the contacts on opening of the circuit. A gas expansion chamber at the entrance to the slat is closed off by a pair of flexible insulating strips. A gas muffler is located at one end of the expansion chamber. The switch blade, in closed position, is spaced from the housing, the slat and the sealing strips by heat resisting spacers.

3,671,698

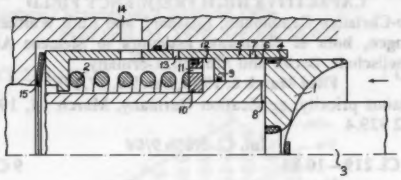
SWITCH CONTACT CHAMBER FOR ELECTRICAL CIRCUIT BREAKERS OF THE GAS BLAST TYPE

Wilhelm Kramer, Sandhausen, Germany, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed July 10, 1970, Ser. No. 53,730
Claims priority, application Germany, July 11, 1969, P 19 35 298.8
Int. Cl. H01h *33/54*
U.S. Cl. 200—148 R **2 Claims**

A circuit breaker of the gas blast type includes a switch contact chamber housing a stationary contact member and a movable contact member which is actuated by pressurized gas against a counter force applied by a spring which effects reclosure of the contacts when the pressurized gas ceases to be ap-

plied. Associated with the movable contact member is a dual piston structure operating in a damping cylinder which damps



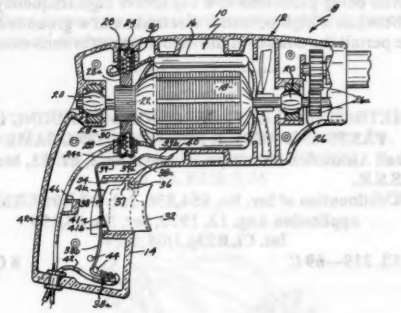
the opening movement of the movable contact as well as the reclosing movement.

3,671,699

POWER TOOL CONTROL

Benjamin H. Matthews, Peninsula, Ohio, assignor to Lucerne Products, Inc., Northfield, Ohio

Filed Nov. 19, 1970, Ser. No. 90,985
Int. Cl. H01h *21/10*
U.S. Cl. 200—157 **16 Claims**



A control for power tools, power appliances, or the like, such as for instance, an electric drill, wherein a trigger member is movable on a support from an off position to an on position and vice versa. An electrical conducting spring-like member coacts with the trigger for movement therewith. An electric motor including opposing brush assemblies is provided in the tool with a current conducting line connected to one side of the motor and another current conducting line connected to the electrical conducting member. The trigger is operative to move the electrical conducting member into electrical conducting relation to one of the brush assemblies thereby completing the circuit to the motor upon predetermined movement of the trigger toward its on position. Release of the trigger by the finger of the operator causes the spring-like electrical conducting member to move away from circuit completing relation with the motor thereby deenergizing the motor, and moving the trigger toward off position.

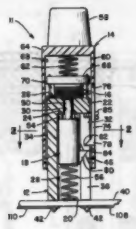
3,671,700

MOMENTARY MULTIPLE CONTACT SWITCH AND OPERATING KEY THEREFOR

Jack L. Metz, Des Plaines, Ill., assignor to Teletype Corporation, Skokie, Del.

Filed Oct. 19, 1970, Ser. No. 82,029
Int. Cl. H01h *13/50*
U.S. Cl. 200—160 **12 Claims**

The contact assemblies of a pile-up are separated each from an adjoining thereof by a thin spacer with an opening through which a flexible contact portion of one assembly is projectable into engagement with a like portion of an adjoining assembly. A key operated impactor is arranged adjacent one end of the pile-up in alignment with the flexible portions and becomes tensioned upon key operation. Tensioning force of the impactor is released during key operation through the agency of a cam which overcomes the impactor tensioning means for driving the impactor into impacting engagement with the flexible



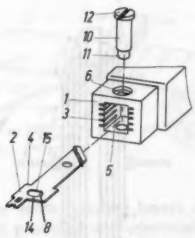
portion of the proximate contact assembly. In consequence of the impacting force, the contact portions of the assemblies successively are driven into engagement and develop a condition of simultaneous momentary engagement to close a circuit, the input to which is through the contact assembly on the end of the pile-up distal to the impactor.

3,671,701

CONTACT SPRING ASSEMBLY FOR RELAYS AND SIMILAR SWITCHES

Alfred Bellmann, Berlin, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 27, 1970, Ser. No. 93,153
Claims priority, application Germany, Dec. 4, 1969, P 19 60 865.2
Int. Cl. H01h *1/00*
U.S. Cl. 200—166 J **5 Claims**



A contact spring assembly is held together by a body of insulating material provided with guide slots into which the contact spring sheets are inserted individually. A cut-out projection portion of the sheets engages the block but does not always guarantee a reliable and firm seating. An eccentric bolt is passed through boreholes in both the sheets and the body of insulating material, and is turned therein for providing a firm assembly therebetween.

3,671,702

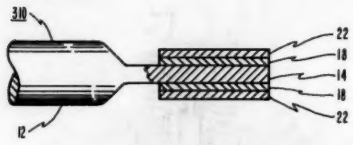
AN ELECTRICAL CONTACT STRUCTURE FOR A SWITCH REED COMPRISING GOLD AND PALLADIUM LAYERS

Edward S. Penczek, Fisher, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed March 15, 1971, Ser. No. 124,312
Int. Cl. H01h *1/02*
U.S. Cl. 200—166 C **11 Claims**

A switch reed embodies an electrical contact comprising a plurality of layers of electrical contact material disposed on at

least one surface of a flattened portion of the reed. A layer of gold of the contact is disposed on the reed surface and at least



one of the other layers comprising the contact is of palladium metal.

3,671,703

DEVICE FOR CRUCIBLE-FREE, FLOATING ZONE MELTING A CRYSTALLINE

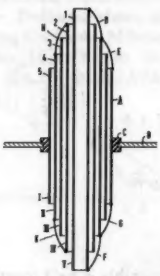
Wolfgang Keller, Pretzfeld, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 27, 1970, Ser. No. 23,366

Claims priority, application Germany, March 29, 1969, P 19 11 317.8

Int. Cl. H05b 9/06

U.S. Cl. 219—10.75 **7 Claims**



Device for zone melting a crystalline rod includes a vessel, an induction heating coil mounted in the vessel for heating a molten zone formed in a crystalline rod, and an electric current supply for the induction heating coil extending into the vessel through an opening formed in a wall of the vessel, the current supply including a plurality of mutually telescoped conductor tubes radially spaced from one another, the plurality of telescoped conductor tubes including a first sequence of alternately disposed tubes and a second sequence of tubes disposed in alternating relationship with the first sequence of alternately disposed tubes, all of the tubes of the first sequence of alternately disposed tubes being electrically connected at both ends thereof, and all of the tubes of the second sequence of alternately disposed tubes being electrically connected at both ends thereof.

3,671,704

APPARATUS FOR CONTROLLING THE FIELD INTENSITY IN MATERIAL PROCESSED IN A CAPACITIVE HIGH FREQUENCY FIELD

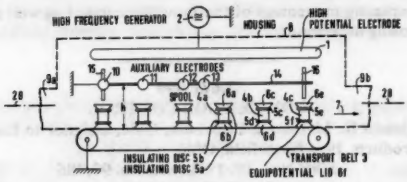
Hans-Christian Grassmann, Igelsdorf, and Emil Walther, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 6, 1970, Ser. No. 17,175

Claims priority, application Germany, March 14, 1969, P 19 12 929.4

Int. Cl. H05b 9/04

U.S. Cl. 219—10.81 **9 Claims**



A plurality of auxiliary electrodes positioned between material being processed in a capacitive high frequency field and between a high potential electrode and a grounded electrode permit the control of the field intensity in such material.

3,671,705

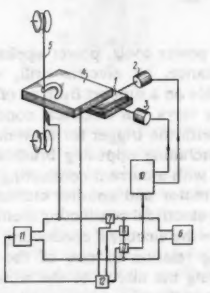
METHOD OF ELECTROEROSION MACHINING OF PARTS AND DEVICE FOR EFFECTING SAME

Mikhail Alexeevich Raznitsyn, ul Arbat 54/2, kv. 83, Moscow, U.S.S.R.

Continuation of Ser. No. 654,836, July 20, 1967. This application Aug. 12, 1970, Ser. No. 63,296

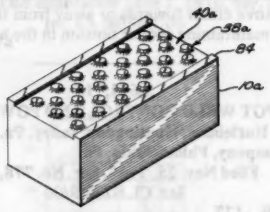
Int. Cl. B23p 1/08, 1/14

U.S. Cl. 219—69 C **8 Claims**



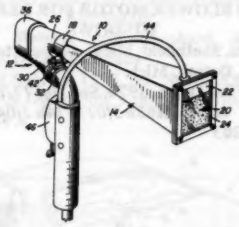
A method and device for effecting electroerosion machining comprises a high-frequency source of pulses of a relatively low amplitude of current and a low-frequency source of pulses of a relatively high amplitude of current controlled by circuits for automatically switching over said sources in response to a decrease in the interelectrode gap value and for switching them back after a predetermined period of time. Alternatively a source of variable frequency of pulses of electric energy with a high amplitude of voltage may be employed with a pulse step-down transformer and circuits for automatic decrease of the frequency of the source and its direct connection with the electrodes for a predetermined period of time in response to a decrease in the interelectrode gap value, there being provided control elements for disconnecting the windings of the transformer and directly connecting the high-voltage source with the electrodes, and for restoration of the circuits after a predetermined period of time.

3,671,706
SHEET-GRIPPER POST FORMED BY EDM
Luther W. Littrell, West Carrollton, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed Sept. 21, 1970, Ser. No. 74,027
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 M 1 Claim



A gripper post cooperates with a gripper finger to grip a sheet therebetween. The gripper post comprises a body and a plurality of raised portions. The plurality of raised portions are distributed throughout a surface of the body and have substantially coplanar contact surfaces for contacting the sheet when the sheet is gripped thereby. The raised portions are defined by valleys surrounding the raised portions and are formed by an electrical discharge machining process.

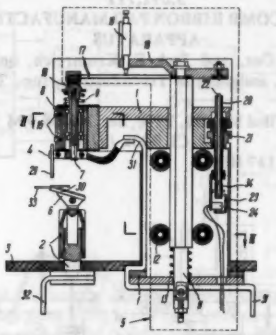
3,671,707
UNDERWATER WELDING DEVICE
William G. Cunningham, 315 Buquet Street, Houma, La.
Filed March 16, 1971, Ser. No. 124,868
Int. Cl. B23k *9/16*
U.S. Cl. 219—74 9 Claims



An elongated viewing tube tapering from an enlarged viewing window mounting end to a narrower nozzle connected end. The nozzle includes a straight passage therethrough which defines a continuation of the viewing tube, and a branch passage which receives the electrode. Inert gas is introduced into the viewing tube adjacent the viewing window and moves through the viewing tube so as to meet with the gas from the torch tip at the weld puddle at which point the water is blown out of the end of the device so as to provide a clear view of the welding operation. An internal light is provided within the viewing tube and the outer end of the nozzle includes a flexible skirt which assists in excluding water.

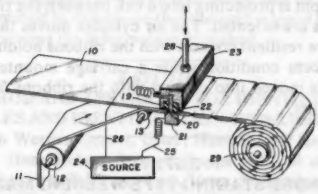
3,671,708
APPARATUS FOR ELECTRIC CONTACT SPOT WELDING, PREFERABLY OF SMALL-SIZE PARTS
Vladislav Eduardovich Moravsky, Bulvar Lesi Ukrainki, 2, kv. 50; David Solomonovich Vorona, ulitsa Scherbakova, 51, kv. 21, both of Kiev, and Boris Pavlovich Shinkarenko, ulitsa Sovetskaya, I, Fastov Kievskoi Oblasti, all of U.S.S.R.
Filed Oct. 7, 1969, Ser. No. 864,972
Int. Cl. B23k *9/00*
U.S. Cl. 219—78 2 Claims

The present invention relates to apparatus for electric contact welding, preferably, of small-size parts, wherein a movable rod supporting the top electrode holder is connected through at least one leaf spring to a mechanism adapted to develop a contact welding pressure. The end of this leaf spring is rigidly secured to the mechanism adapted to develop the contact welding pressure and the other end of this leaf spring



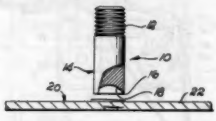
freely bears upon the rod supporting the top electrode holder. The high-current electric conduit which supplies the welding current to the top electrode holder has a portion, adjacent to the top electrode holder, which extends perpendicularly to the housing of the bottom electrode holder.

3,671,709
HEAT SEALING OF POROUS MATERIALS
Lester Gidge, Nashua, N.H., assignor to Monsanto Company, St. Louis, Mo.
Filed Sept. 14, 1970, Ser. No. 71,656
Int. Cl. B23k *13/02*
U.S. Cl. 219—10.53 5 Claims



An apparatus for seam bonding layers of fabric by radio frequency power is provided with electrodes at least one of which is flanked by and is recessed in a resilient insulating member which acts to fill the voids in the fabric during bonding and resultingly prevents electrical arcing through the fabric.

3,671,710
WELDING STUD AND METHOD
Ivan G. Coombs, Redondo Beach, Calif., assignor to John A. Stephens, Los Angeles, Calif.
Filed June 17, 1970, Ser. No. 47,053
Int. Cl. B23k *9/20*
U.S. Cl. 219—99 2 Claims



A welding stud having a cylindrical welding end with a continuous annular peripheral edge surrounding a centrally axial

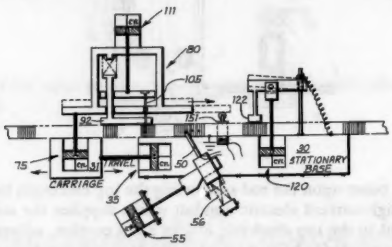
recess, the weldable end and the metal sheet to which it is to be attached being brought together in a substantially parallel relationship, whereby a ring discharge of the arc is effected along the annular edge.

3,671,711

HONEYCOMB RIBBON PAD MANUFACTURING APPARATUS

Frederick L. Cox, and Jack E. Krumreich, both of Terre Haute, Ind., assignors to Tri-Industries, Inc., Terre Haute, Ind.

Filed May 20, 1970, Ser. No. 38,994
Int. Cl. B23k 11/10
U.S. Cl. 219—117 HD 9 Claims



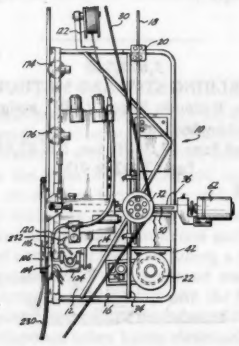
An apparatus to assemble and weld corrugated metal ribbon to form a honeycomb pad. A horizontal feeding mechanism is provided by a pair of clamping arrangements one mounted on a stationary base and one mounted on a horizontally movable carriage which moves the one clamping arrangement toward and away from the other. The movable carriage has mounted thereon a ribbon pressure pad and an alignment pin. An air cylinder on said carriage moves the ribbon pressure pad and alignment pin toward the corrugated ribbons until the pointed alignment pin is projecting into a cell between the ribbons and the ribbons are oriented. The air cylinder moves the pressure pad into the resilient contact with the ribbons holding them in a flat uniform condition while a carriage mounted welding electrode is moved into contact with the ribbons for welding them together.

3,671,712

SUSPENDED STAGING TYPE WELDING MACHINE

Sidney L. Fisher, Renton, Wash., assignor to Spider Staging, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 861,757, Sept. 29, 1969. This application Dec. 10, 1970, Ser. No. 96,757
Int. Cl. B23k 9/12
U.S. Cl. 219—125 R 11 Claims



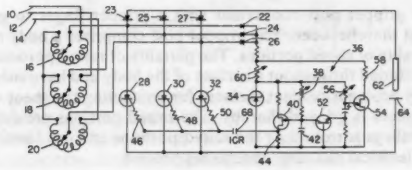
A single cable type suspended staging is guided for vertical travel along plate members being welded together by coplanar, vertically spaced apart guide wheels. The guide wheels run in the gap between the members and are each spring biased towards the work surface. Two electroslag form shoes are supported from the staging below the guide wheels. Each shoe is independently spring biased into contact with its side of the plate members. One or more tensioned hold-in lines hold the staging inwardly against the plate members. Each hold-in line rides on a sheave which is automatically controlled to move either towards or away from the object for the purpose of maintaining proper tension in the hold-in line.

3,671,713

ARC SPOT WELD CONTROL AND POWER SUPPLY

Richard P. Hurlebaus, Huntingdon Valley, Pa., assignor to The Budd Company, Philadelphia, Pa.

Filed Nov. 25, 1968, Ser. No. 778,437
Int. Cl. B23k 9/00
U.S. Cl. 219—127 3 Claims



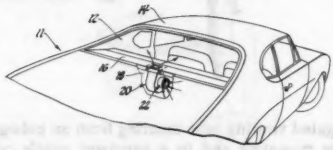
A three phase power source is used to trigger a welding gun. A timing circuit produces a series of pulses to actuate switching circuits to permit application of the power from the three phase power supply to the welding gun.

3,671,714

HEATED BLOWER MOTOR FOR DEFROSTING WINDOWS

Norman Charns, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1970, Ser. No. 77,798
Int. Cl. H05b 3/02; F24h 3/04
U.S. Cl. 219—203 2 Claims



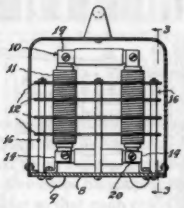
An electric motor driven blower adapted to defrost an automobile window and having inlets and outlets in opposite ends of the motor casing to direct air through the interior of the motor past the motor armature. The air is warmed during passage by contact with a plurality of electrically isolated closed loops of conductive material mounted in circumferentially spaced, axially directed slots on the armature. Hysteresis heat losses are produced in the loops by the movement of the closed loops through the motor's magnetic field. A

fan and duct at one end of the motor direct the warmed air against the automobile window for defrosting.

3,671,715
ELECTRIC INDUCTION GAS HEATER

Henry J. Burnett, 55 Glenwood Road, West Hartford, Conn.

Continuation-in-part of Ser. No. 554,955, June 1, 1966, Pat. No. 3,534,197. This application June 1, 1970, Ser. No. 42,324
Int. Cl. H05b *5/08*
U.S. Cl. 219—374 **2 Claims**

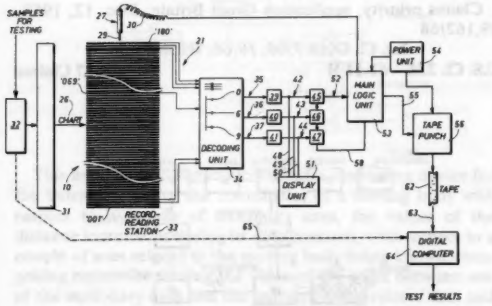


An electric induction heater has at least one primary coil wound on a magnetic core. Fins are provided which have a pair of holes therethrough through which spaced portions of the core extend. The fins are mounted in such a manner as to be spaced from and thereby electrically insulated from the core and primary coil. The fins act as short-circuited secondaries so that heat is generated by induced current at two places in each fin when the primary coil is energized. Circuit means are provided whereby power is applied gradually to the heater so as to prevent a sudden overload of the electric supply line.

3,671,716
METHOD AND APPARATUS OF DIGITIZING ANALOG RECORDS

Arthur Samuel Slutsky, 555 Shepherd Avenue West, Downsview 473, Ontario, Canada

Filed Aug. 24, 1970, Ser. No. 66,538
Int. Cl. G06k *7/06, 9/00;* **G08b** *5/00*
U.S. Cl. 235—61.6 A **17 Claims**

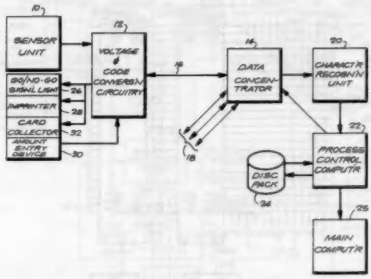


An analogue chart or record obtained from an automatic analyzer is positioned on a record-reading panel structure and a probe electrode is manually pushed through the chart at a desired position thereon, for example, at the peak of a curve, so as electrically to contact an underlying one of a number of mutually separated electrical contact strips. Individual conductors extend from all such strips to a decoding unit which provides a multi-digit decimal identification of the strip which is contacted by the probe electrode. The decoding unit is in turn coupled to a coding unit in which the decimal digits identifying the actuated strip are converted into a binary coded decimal form for subsequent sequential recording in a tape punch unit to provide an output in a form suitable for further processing in an off-line digital computer.

3,671,717
CREDIT CARD VERIFICATION SYSTEM

Albert H. Bieser, 609 Carroll Drive, Garland, Tex.

Filed Oct. 24, 1969, Ser. No. 869,188
Int. Cl. G06k *7/04*
U.S. Cl. 235—61.17 B **7 Claims**

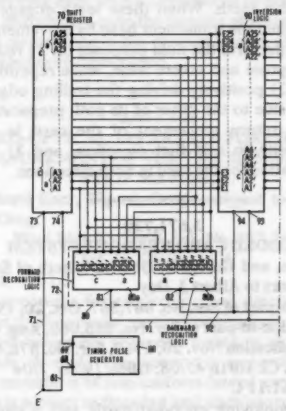


Credit card verification system wherein feelers are used for displaying flags positioned in the path of beams of light which impinge upon photo cells. As the raised characters on an embossed credit card pass beneath the feelers, the flags will be displaced. Movement of the flags is sensed and pulses applied to a transmission line each time the feelers sense a leading edge of a character. The pulses are applied to a bank of shift registers which selectively permit signals of discrete frequencies identified or associated with particular stages of the shift registers to be applied through a summing junction to an operational amplifier. The mixed frequencies produce two sets of chords, one set of which provides horizontal information as to a particular character and the other which provides vertical information as to the character. The unique chord sets representative of each character are detected in a filter-integrator matrix in which amplitude is used to discriminate against extraneous noise. The information is converted to binary form and applied to a computer which can use the information furnished to determine that the card is good or bad and otherwise process the information furnished.

3,671,718
METHOD AND APPARATUS FOR IDENTIFYING ARTICLES AND IDENTIFICATION SIGN THEREFOR

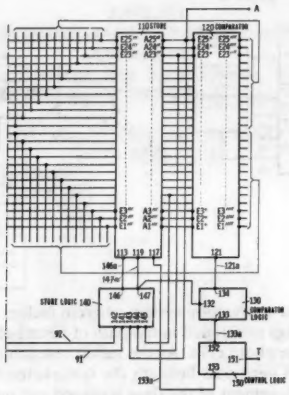
Hans-Ulrich Werner Genzel, Uster; Hans-Rudolf Hafeli, Seengen, and Hans Robert Steiner, Rapperswil, all of Switzerland, assignors to Zellweger Ltd., Uster, Switzerland

Filed July 29, 1970, Ser. No. 59,116
Claims priority, application Switzerland, Aug. 20, 1969, 12606/69
Int. Cl. G06k *7/10, 19/04;* **E04g** *17/00*
U.S. Cl. 235—61.11 E **21 Claims**



The identification sign is formed with a starting code, an in-

termediate information code and end code. The starting and end codes are used in the code recognition logic to indicate when a valid configuration of a pulse sequence of the identification sign has been read either forwards or backwards by a



trace of a reader. The recognition logic can be constructed to initiate reading out of a valid configuration for further processing either in dependence on a single trace or two traces passing through the center of the identification sign.

3,671,719

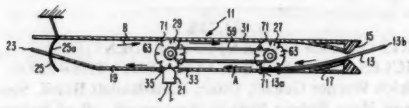
ROLLER STRUCTURE FOR CARD READER

Gordon Herbert May, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed April 19, 1971, Ser. No. 135,000

Int. Cl. B65h *5/06;* **G06k** *17/00*

U.S. Cl. 235—61.11 D **9 Claims**



A magnetic card reader has one or more specially structured resilient rollers of generally cup-shaped configuration, which engage successive cards to align them with a guiding surface and propel them past a transducer head. The rollers have a series of wedge-shaped cuts formed in their annular periphery to produce a plurality of radially projecting and individually flexible teeth. When these teeth engage the card after it has reached the transducer head by movement in a first direction, they perform the dual purposes of: 1) reducing the prospects of rupture and severe wear, while repetitively driving the cards, 2) positively driving the trailing edge of each card from one side to the other of its path preparatory to initiation of the return movement of the card in a second direction opposite to said first direction, and 3) providing positive registration for the card in both directions.

3,671,720

ENCODED CARD READOUT SYSTEM

James E. White, and George S. Oberhart, both of San Mateo, Calif., assignors to Albert J. Day

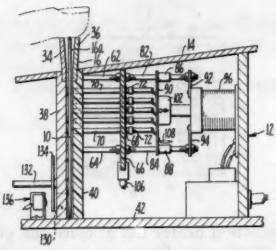
Continuation-in-part of Ser. No. 867,567, Oct. 20, 1969, which is a continuation-in-part of Ser. No. 855,068, Aug. 4, 1969.

This application Nov. 20, 1969, Ser. No. 878,410

Int. Cl. H01h *43/08;* **G06k** *19/06, 7/04*

U.S. Cl. 235—61.11 C **7 Claims**

A system employing encoded cards and a card readout machine wherein the cards incorporate both embossments and a light responsive encoding surface which cooperate with said machine to read out information encoded on individual cards. The readout machine which is employed in the system may be adapted for either "on line" usage with a computer or perform "off line" functions. Regardless of the usage to which it is adapted, the machine employs embossment encoding readout means in the form of a plurality of sensing pins which are mounted for movement within the machine and are adapted to be brought into engagement with an encoded card



when it is suitably positioned within the machine. The pins perform switching functions in the machine's card readout circuitry in response to the locations of the embossments on the card. The embossments may take the form of embossed card identification numerals or a pattern of discrete embossments arranged in accordance with a predetermined code. The card further includes a light responsive encoding surface which cooperates with a suitable light source on the machine for anticounterfeit or fraud detection purposes.

3,671,721

DATA READING SYSTEMS

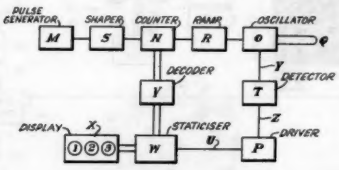
Bernard Albert Hunn, Berkhamsted, and Elgan Neville Howell, Hatfield, both of England, assignors to Revenue Systems Limited, Luton, Bedfordshire, England

Filed Dec. 12, 1969, Ser. No. 884,601

Claims priority, application Great Britain, Dec. 12, 1968, 59,162/68

Int. Cl. G06k *7/08, 19/06;* **H03b** *23/00*

U.S. Cl. 235—61.11 H **17 Claims**



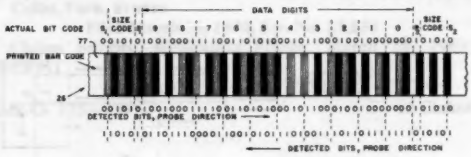
A data reading system for use particularly in cash- or goods-dispensing machines in which the data to be read is represented by a plurality of passive resonant devices in or on a card and in which, when said data is to be read from said card, said card is placed in the field of a reactive element fed with variable frequency oscillations and associated with counting means in such a way that the count registered by said counting means indicates the resonant frequency of any one or more of said resonant devices located in said field.

A card for use in such a system comprises a plurality of passive resonant devices, the resonant frequencies of which represent the data carried by the card.

3,671,722
TRANSITION CODE RECOGNITION SYSTEM

John B. Christie, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed June 30, 1969, Ser. No. 837,850
Int. Cl. G06k 7/10, 9/18, 19/06
U.S. Cl. 235—61.12 N 11 Claims

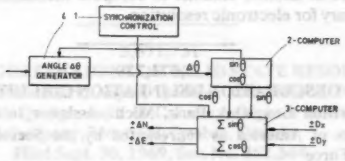


A transition code recognition system which includes a coded record medium (like a color-coded label) which may, if desired, be secured to an article. The record medium utilizes detectable indicia like color bands placed on the record medium in a reading order so that each color band is different from the preceding one. The color transitions from one color band to the next, when reading, are used to identify binary states "1" and "0," and the transitions obviate the need for a separate clocking arrangement. An optical probe scanner is used to read the record medium by "scribing" or gliding the probe scanner across the color bands, and the changing light signals resulting from the reading operation are routed to electronic circuitry for interpretation and processing.

3,671,723
DEVICE FOR COORDINATE CONVERSIONS

Robert Delignieres, Colombes, and Jean-Francois Therond, Neuilly, both of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rucil Malmaison (Hauts de Seine), France

Filed Oct. 2, 1970, Ser. No. 77,588
Claims priority, application France, Oct. 2, 1969, 6933777
Int. Cl. G06f 15/50
U.S. Cl. 235—150.27 6 Claims



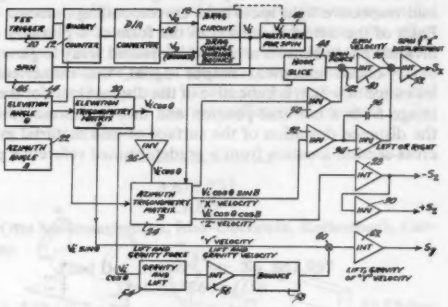
This invention relates to a coordinate converting device for the determination of the coordinates of a moving body with respect to a couple of stationary axes, the values of the distance increments during its displacement, with respect to a couple of axes related to the moving body being known, comprising means for sensing the value of the angle between one of the stationary axes and the corresponding related axis and means for accumulating the values of said distance increments and determining therefrom the travel path of the moving body with respect to said stationary axes.

3,671,724
GOLF GAME COMPUTER INCLUDING MEANS FOR APPROXIMATING THE EFFECTS OF BACKSPIN ON RANGE

James W. Sanders, Grand Haven, Mich., assignor to Brunswick Corporation

Filed Dec. 30, 1969, Ser. No. 889,067
Int. Cl. G06g 7/48; A63b 67/02
U.S. Cl. 235—151 1 Claim

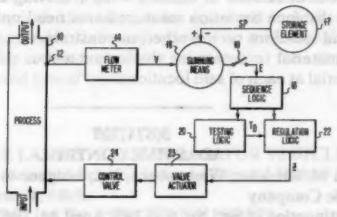
A computing system for calculating the free flight trajectory of a golf ball struck from a tee having backspin imparted thereon including a backspin corrector therein for modifying the calculated distance of the golf ball so as to simulate the effects of backspin. A signal modifier alters the magnitude of a signal related to the distance the golf ball would travel proportionally according to a characteristic of the flight trajectory.



3,671,725
DEAD TIME PROCESS REGULATION

Roger M. Bakke, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 490,592, Sept. 27, 1965, abandoned. This application Oct. 1, 1970, Ser. No. 77,387
Int. Cl. G05b 13/00
U.S. Cl. 235—150.1 10 Claims



Method of regulating processes having dead time wherein an error signal is generated representing the deviation of a controlled variable from a set point. The error signal is compared to a predetermined limit, and if it exceeds the limit, it is employed to regulate the process. If it does not exceed the limit, the process dead time is determined by impressing a high frequency disturbance onto the process at a control point, detecting the disturbance at the process output, and the time interval therebetween determined.

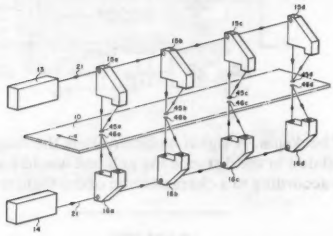
3,671,726
ELECTRO-OPTICAL APPARATUS FOR PRECISE ON-LINE MEASUREMENT OF THE THICKNESS OF MOVING STRIP MATERIAL

James Richard Kerr, Tigard, Oreg., assignor to Morvue, Inc., Tigard, Oreg.

Filed May 23, 1969, Ser. No. 827,266
Int. Cl. G01b 11/06
U.S. Cl. 235—151.3 17 Claims

On-line apparatus for monitoring and determining the instantaneous thickness of a moving longitudinal strip of planar material simultaneously at several locations along the lateral cross-section thereof. The apparatus is particularly useful where the material is of non-uniform lateral cross-section and in addition is subject to flopping and undulatory movement in its travel past the monitoring station. The electro-optical system utilizes a pair of laser light sources, with associated

beam splitter and lens systems, for focusing a plurality of spots of light of well-defined small diameter on the respective major surfaces of said material at locations along the lateral cross-section thereof, and then projecting the reflected images of said respective light spots onto corresponding detector units. Each of the detector units is in the form of a plurality of individual photo-sensors arranged in masked array to generate a binary-coded electrical output signal, the numerical significance of which is indicative of the displacement of the light image from a nominal position and thus is representative of the distance deviation of the surface of said material at each cross-section location from a predetermined reference plane.



Arithmetic and logic elements next operate on the respective digital output signals from said detector units to derive resultant numerical measurements of the instantaneous thickness of said moving material at each of said lateral locations. In cases where one of the major surfaces of the moving material is constrained to a fixed plane, for example by having its bottom surface in contact with a moving conveyor bed, then distance deviation measurements need only be made at lateral locations on the other, unconstrained major surface of the material to determine the instantaneous thickness of the material at each of said locations.

3,671,727

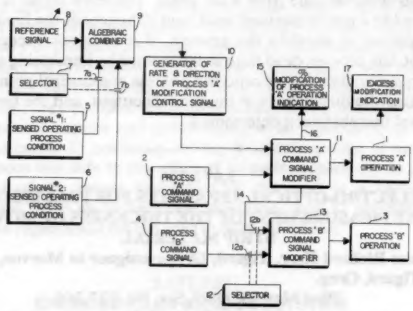
ADAPTIVE CONTROL

John M. Rhoades, Waynesboro, Va., assignor to General Electric Company

Continuation of Ser. No. 633,295, April 24, 1967, abandoned. This application Sept. 10, 1970, Ser. No. 71,195

Int. Cl. G05b *19/18, 13/02*

U.S. Cl. 235—151.11 **25 Claims**


REFERENCE SIGNAL
ALGEBRAIC COMBINER
SELECTOR
SIGNAL "1" SENSED OPERATING PROCESS CONDITION
SIGNAL "2" SENSED OPERATING PROCESS CONDITION
GENERATOR OF RATE & DIRECTION OF PROCESS 'A' MODIFICATION CONTROL SIGNAL
MODIFICATION OF PROCESS 'A' OPERATION INDICATION
EXCESS MODIFICATION INDICATION
PROCESS 'A' COMMAND SIGNAL MODIFIER
PROCESS 'A' OPERATION
PROCESS 'A' COMMAND SIGNAL
PROCESS 'B' COMMAND SIGNAL
PROCESS 'B' COMMAND SIGNAL MODIFIER
PROCESS 'B' OPERATION
SELECTOR

To provide control for an automatic processing operation which is self-adapting to changes in operating conditions during the processing operation, selected combinations of the operating conditions are sensed and utilized to modify the programmed commands controlling the processing operation. Where the commands are in the form of digital signals, the recurrence rate of such signals is modified in a direction and at a rate which is a function of the sensed operating conditions.

3,671,728

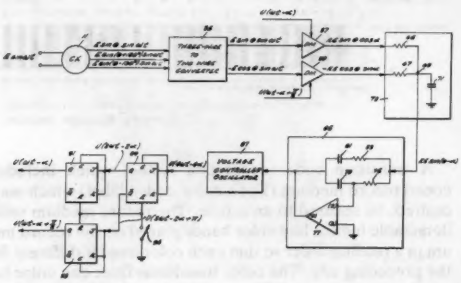
ELECTRONIC REPEATER SERVO

Richard A. Day, Playa Del Rey, and William E. French, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 5, 1970, Ser. No. 77,784

Int. Cl. G06g *7/22*

U.S. Cl. 235—189 **19 Claims**



An electronic servo system utilizing a voltage controlled oscillator to drive a plurality of associated flip-flops to develop phase-variable, quadrature square wave output signals. These quadrature output signals are then used in a feedback loop, in conjunction with electrical signals corresponding to the sine and cosine functions of a shaft angle of a remote synchro transmitter, to drive demodulators whose outputs are summed in an amplifier to produce an error signal which controls the oscillator signal. The system operates to null the error signal and phase-lock the oscillator signal such that the electrical phases of the quadrature output signals are accurately positioned to be proportional to the shaft angle of the remote synchro transmitter. The respective quadrature output signals of, for example, two of the electronic servo systems may be utilized in conjunction with signals to be resolved to drive demodulators whose outputs are respectively summed in one channel and remodulated, demodulated and selectively summed in another channel to compute the vector rotations necessary for electronic resolution.

3,671,729

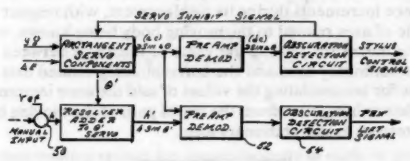
OBSCURATION DELINEATION CIRCUITRY

Foss Britton Lux, Oak Park, Mich., assignor to the United States of America as represented by the Secretary of the Air Force

Filed March 10, 1971, Ser. No. 122,707

Int. Cl. G06g *7/22*

U.S. Cl. 235—186 **3 Claims**



A device for providing an indication, on a radial plot, of all the terrain obscured from the view of an assumed observer who is located at some reference elevation above the origin of the plot. The output is obtained by means of an X-Y plotter or coordinatograph. The stylus of the coordinatograph traces a series of radial straight lines from the point corresponding to the observation point. The stylus is lowered to provide a visible record if the terrain is visible from the observation point, and is raised to record a gap if the terrain is obscured or not visible. The device functions by storing a quantity representative of the largest value of the look angle, as the terrain is

scanned from the center outward, and treats all terrain with a look angle smaller than any previous look angle as obscured.

3,671,730

ELECTRONIC DEVICE FOR PLANE GRAPHICAL REPRESENTATION WITH PERSPECTIVE EFFECT

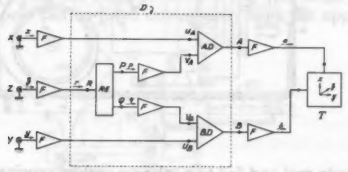
Maurice J. M. Pilato, Paris, France, assignor to Marc Norbert Collet, Paris, France

Filed March 30, 1970, Ser. No. 23,659

Claims priority, application France, March 24, 1969, 6908571

Int. Cl. G06g 7/04, 7/26

U.S. Cl. 235—189 15 Claims



The present invention concerns an electronic device supplying a plane graphical representation with perspective effect of three voltages.

An electronic device comprising three electrical signal input channels denoted by X, Y and Z, a signal distributor receiving electrical signals denoted by x, y and z supplied respectively by the three channels X, Y and Z and supplying electrically signals a and b to two channels respectively denoted by A and B, the function of the signal distributor to amplify and combine the electrical signals x, y and z supplied to it for supplying to the channel A a signal $a = k \cdot x + m \cdot z$ and for supplying to the channel b a signal $b = l \cdot y + n \cdot z$, the amplification factors k, l, m and n being independent of each other and negative or positive.

Generally, the invention is applied to the representation of any quantities which can be translated into electrical signals, the variations of some of which as are functions of the other it is useful to know.

3,671,731

PYTHAGOREAS ADDER OR SOLID STATE RESOLVER

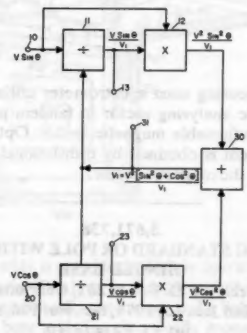
Gilles J. Denoncourt, Anjou, Quebec, and Peter T. Nejedly, Montreal, Quebec, both of Canada, assignors to Canadian Marconi Company, Montreal, Quebec, Canada

Filed Sept. 30, 1969, Ser. No. 862,344

Claims priority, application Canada, Oct. 9, 1968, 032,096

Int. Cl. G06g 7/22

U.S. Cl. 235—192 2 Claims



A system for providing the square root of the sum of the squares of two input signals which can also be used to extract the common carrier component of the sin and cos output windings of a synchro differential resolver. Each input signal is applied to a divider means and to a multiplier means. The output of the divider means constitutes the other input to the multiplier means, and the output of both multiplier means are fed to an adder. The output of the adder constitutes the other input to the divider means. In addition, the output of the adder constitutes the square root of the sum of the squares of the two input signals or the common carrier component of the sin and cos output windings of a synchro differential resolver — depending on the application.

3,671,732

LAMP

Knut Otto Sassmanshausen, Idar-Oberstein, Rothenbach, Germany

Filed Dec. 8, 1969, Ser. No. 882,997

Int. Cl. B60q 1/30

U.S. Cl. 240—8.3 19 Claims

A double-beam lamp, such as a taillight or warning light has a collective lens bulb in the axis of a surrounding reflector in whose focal space, the luminous wire of the lens bulb is located. The collective lens projects a first beam, and the reflector, whose shape deviates from a geometrical parabola, projects a second beam, and while one of the beams is made narrow and conical, the other beam is spread in horizontal direction by a cylindrical dispersing lens over a wide angle for lateral visibility while remaining narrow in the vertical direction to avoid loss of light.

3,671,733

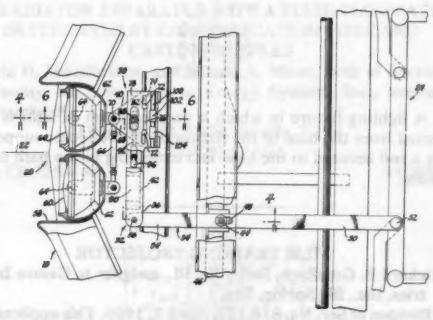
STEERABLE LAMP SYSTEM FOR MOTOR VEHICLES

John W. Yee, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 20, 1971, Ser. No. 108,070

Int. Cl. B60q 1/12

U.S. Cl. 240—8.25 3 Claims



A steerable lamp system for a motor vehicle wherein a pair of supplemental driving lamps operable through a control linkage connected to the vehicle steering system are rotated in the direction of vehicle travel in response to steering movement. The control linkage includes a motor-powered extensible link electrically coupled to the vehicle turn signal system that pivots the lamps in the direction of a contemplated turn prior to initiation of the actual turning sequence.

3,671,734

RELOADABLE ELECTRIC FLASHLIGHT

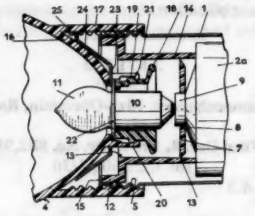
Rene M. Angibaud, Bois-Jerome, France, assignor to Societe Les Piles Wonder, Saint Ouen (Seine Saint Denis), France

Filed Dec. 21, 1970, Ser. No. 99,776

Claims priority, application France, Dec. 23, 1969, 6944538

Int. Cl. F21l 7/00

U.S. Cl. 240—10.66 **2 Claims**



A battery and case assembly attachable to the head of a flashlight to facilitate replacement of batteries. The head has a recess and the case has a closure member at the end thereof received into the recess. The closure member includes a pierced cap and readily breakable means attaching the cap to an annulus around the cap. A sleeve secured to the annulus spaces the batteries from the annulus and prevents normal electrical contact with the batteries until the cap is detached from the annulus.

3,671,735

LIGHTING FIXTURE

Charles S. King, Old Manor House, Cubbington, England

Filed July 20, 1970, Ser. No. 56,352

Int. Cl. F21m 7/00

U.S. Cl. 240—41.1 **7 Claims**

A lighting fixture in which a parallel beam of light is projected from the base of the fixture onto a reflector supported by a rod secured to the base and extending in the path of the beam.

3,671,736

FILM TRAINING PROJECTOR

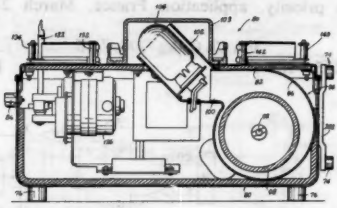
Richard P. Gundlach, Belleville, Ill., assignor to Gamco Industries, Inc., Big Spring, Tex.

Division of Ser. No. 814,127, April 7, 1969. This application June 8, 1970, Ser. No. 44,478

Int. Cl. F21v 29/00; G03b 21/16

U.S. Cl. 240—47 **1 Claim**

A visual training projector for projecting intelligible matter from one or two films. The projector may be used to project stationary pictures or motion pictures, as desired, by control from a remote control unit such as a remote operator's handle. Provision is made through a specially designed blower to provide for cooling the projector lamp bulb to accommodate projection from either a horizontal or vertical plane. Special loading means are provided for the film in pressure plates at the projector through solenoid operated gates to provide ready accessibility for loading and unloading. Advancement of the film, past the film aperture, is effected through solenoid and cam operated vibrated shuttles, which are mounted on a ball pivot for two directions of freedom to hold and actuate the film. In order to reduce wear on the film, the film is taken from a supply reel and fed to a take-up reel by sensing arms which sense the tension in guided film loops and control supply and take-up motors to control the play out and take up of the film reels. Where, in addition to the front film, a rear film is used for fixation upon the front film, provision is made for feeding the films in the same direction to facilitate timing. The construction of the film reels and spindles is so designed that the film reels may be wound in either clockwise or counterclockwise direction.



3,671,737

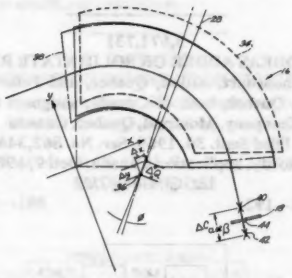
METHOD FOR FOCUSING A DOUBLE FOCUSING MASS SPECTROMETER

Charles W. Hull, Sierra Madre, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 7, 1969, Ser. No. 822,610

Int. Cl. H01j 39/34

U.S. Cl. 250—41.9 ME **5 Claims**



A double focusing mass spectrometer utilizing an electric and a magnetic analyzing sector in tandem provided with a mechanically adjustable magnetic sector. Optimum focusing of the instrument is obtained by translational and rotational adjustments of the magnetic sector.

3,671,738

LIGHTING STANDARD OR POLE WITH DOUBLY HINGED BASE

Robert W. Beachley, P.O. Box 11281, Charlotte, N.C.

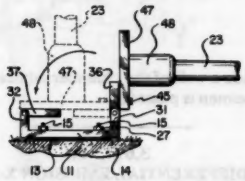
Filed Jan. 13, 1971, Ser. No. 106,180

Int. Cl. F21s 13/10

U.S. Cl. 240—84 **10 Claims**

A lighting standard or pole is provided with a base assembly including a ground concrete base having upstanding studs ar-

ranged at the corners of a square, a base plate having openings receiving the studs and adjustable nuts upon the studs for securing the base plate to the studs in a manner that the base plate can be leveled so that the lighting pole will be extended vertically plumb with respect to the ground. The opposite sides of the base plate are extended upwardly and to these opposite sides are opposing hinged plates one of which can be pivoted upwardly and over to the right and the other of which can be pivoted upwardly and over to the left. A top plate is secured by bolts to the hinge plates and upon releasing the bolts at one side of the top plate and from one hinge plate the top plate and the pole can be tilted downwardly from one direction and upon releasing the bolts from the other hinge plate while leaving the bolts attached to the one hinge plate the lighting pole can be tilted downwardly from the opposite



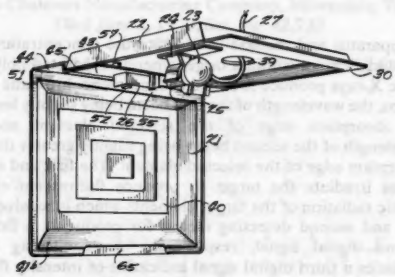
direction. With the pole tilted one way or the other the fixture and the base are made accessible for servicing. The base plate while being connected to four studs has multiple openings to permit the base plate to be oriented detaching the base plate from the studs and replacing the same into other holes angularly disposed from one another about a center opening in the base plate so that the base plate can be angularly oriented to free the lighting fixture from trees or the like when it is desired to tilt the lighting post toward the ground. A split skirt formed of hingeable parts is detachably fitted about the base plate assembly and pole to enclose the same and give a more pleasing appearance. A rust-proof pan is provided under the base plate with sides extending upwardly to enclose the base plate and the hinge plates to permit a recessing of the base assembly into the ground so that the pole top plate would lie just slightly thereabove.

3,671,739

LAMP ASSEMBLY

Lawrence G. McCain, Beverly Hills, Calif., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Dec. 8, 1970, Ser. No. 96,136
Int. Cl. F21v *23/04*
U.S. Cl. 240—122 **14 Claims**



A lamp assembly is provided which is operated by means of the lens or cover. The lens is slidably attached to the metal base, which is electrically grounded, and a light bulb holder is secured to the base and also electrically grounded. A contact connected to a suitable power source is carried by the lens, and sliding movement of the lens with respect to the base brings the contact into and out of electrical engagement with the light bulb.

ERRATUM

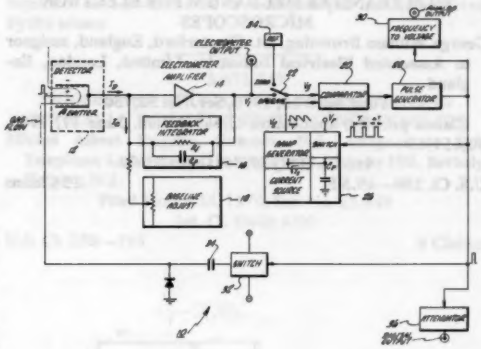
For Class 250—41 see:
Patent No. 3,671,737

3,671,740

FREQUENCY-PROGRAMMED ELECTRON-CAPTURE DETECTOR

J. Howard Marshall, III, Pasadena, and Timothy M. Harrington, Sierra Madre, both of Calif., assignors to Analog Technology Corporation

Filed March 15, 1971, Ser. No. 124,291
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 R **10 Claims**



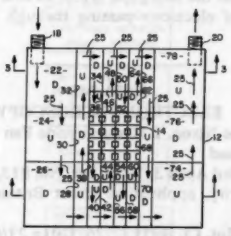
Improved circuitry for increasing the sensitivity of an electron-capture ionization detector includes a closed-loop feedback circuit which varies the frequency of pulses which are applied to the detector. The circuit responds to greater concentrations of predetermined compounds such as gases by increasing the pulse repetition frequency and responds to lower concentrations by decreasing the pulse repetition frequency, always tending to keep the current flowing in the detector circuit near a constant preset value. The pulse frequency will then vary directly with the concentration of sampled compound in the detector, and simple frequency-to-voltage conversion devices can be used to signal such concentrations.

3,671,741

IRRADIATOR APPARATUS WITH A FLUID FLOWPATH DETERMINED BY COMMUNICATING CORE AND CASTING BAFFLES

David D. Woodbridge, and Leland A. Mann, both of Brevard County, Fla., assignors to Energy Systems, Inc., Brevard County, Fla.

Filed Jan. 12, 1970, Ser. No. 2,198
Int. Cl. G01n *21/26*
U.S. Cl. 250—44 **8 Claims**



An irradiator apparatus designed to perform a sterilization treatment or like process on waste material especially in the

liquid state such as sewage or general industrial waste wherein a radiation source in the form of radioactive material is utilized to eliminate various types of micro-organisms or other undesirable elements which are carried by the liquid waste material. The apparatus includes a structure comprising a plurality of parallel baffles arranged about a substantially centrally located core mounted within the casing and structurally designed to support a plurality of radioactive material elements serving as the radiation source. The core also includes a plurality of parallel baffles which communicate with the baffles of the casing to define a somewhat serpentine flowpath along which the liquid travels as it passes through the irradiator.

3,671,742

FILM TRANSFER MECHANISM FOR ELECTRON MICROSCOPES

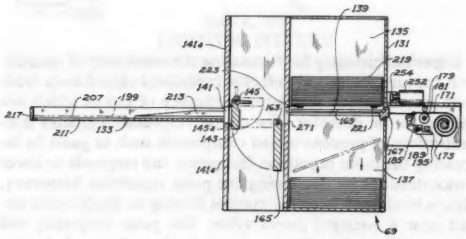
George William Browning, Gt. Chesterford, England, assignor to Associated Electrical Industries Limited, London, England

Filed April 28, 1970, Ser. No. 32,750

Claims priority, application Great Britain, June 17, 1969, 30,657/69

Int. Cl. H01j *37/36;* **G01n** *23/00*

U.S. Cl. 250—49.5 E **15 Claims**



An electron microscope comprising a microscope chamber having a passageway extending therethrough and a film mechanism for driving an electron stimulated means, or film plate, into the microscope chamber. The film mechanism includes a tray disposed within the microscope chamber and communicating with the passageway, a closure member positioned across the passageway for preventing the passage of X-rays through the passageway, a storage chamber disposed externally of the microscope for storing a film plate, and transport means for driving a film plate from the storage chamber to the tray so that the film plate is moved to a position to intercept a beam of electrons passing through an object to be viewed.

3,671,743

ELECTRON MICROSCOPY

William Charles Nixon, 2 Causewayside Fen Causeway, Cambridge, England

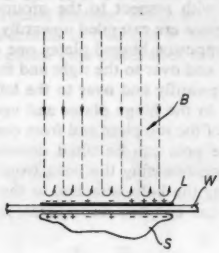
Filed April 3, 1969, Ser. No. 813,259

Claims priority, application Great Britain, July 3, 1968, 15,935/68

Int. Cl. H01j *37/26;* **G01n** *23/00*

U.S. Cl. 250—49.5 A **1 Claim**

Mirror electron microscope techniques are used indirectly to examine the electric or magnetic field in a specimen, such as a biological cell, situated outside the evacuated microscope chamber by examining the field on a layer or surface immediately inside a wall of the chamber adjacent the outside of which the specimen is placed.



3,671,744

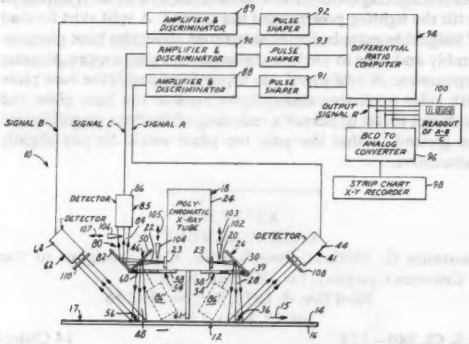
DIGITAL DIFFERENTIAL EMISSION X-RAY GAUGE

Nikiforos Constantine, Brighton, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 5, 1970, Ser. No. 77,833

Int. Cl. G01n *23/22*

U.S. Cl. 250—51.5 **13 Claims**

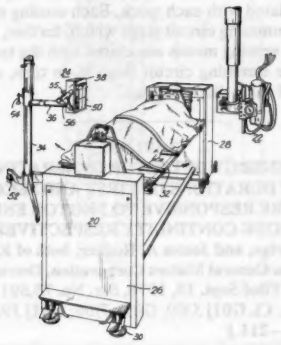


Apparatus and method to indicate the concentration of a selected element within a target wherein separated polychromatic X-rays produce first and second monochromatic X-ray beams, the wavelength of the first beam being slightly less than the absorption edge of the selected element and the wavelength of the second beam being slightly greater than the absorption edge of the selected element. The first and second beams irradiate the target to produce fluorescent characteristic radiation of the target elements which is received by a first and second detecting means for producing a first and second digital signal, respectively. A monitoring means produces a third digital signal indicative of intensity fluctuations of the polychromatic x-rays. A differential ratio computer means produces an output signal which is the difference between the first and second digital signals divided by the third digital signal, which output signal indicates the concentration of the selected element within the target. First, second and third movable wedges are utilized in calibrating the device and to provide an indication of the concentration of the selected element in percent deviation from a standard or in engineering units (mg/dm^2).

3,671,745
THREE DIMENSIONAL AND/OR TIME SEQUENCE X-RAY APPARATUS

John Jacques Fouquart, Northport, N.Y., assignor to Photosystems Corporation, Hauppauge, N.Y.

Filed Nov. 5, 1970, Ser. No. 87,168
Int. Cl. G01n *23/04*; H01j *37/22*
U.S. Cl. 250—61 12 Claims

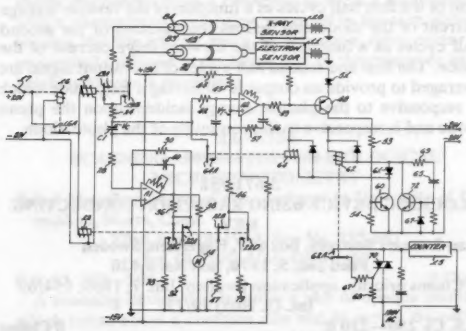


X-ray apparatus including a cradle or platform unit, X-ray recording unit and an X-ray source. The cradle unit supports a patient and provides for rotating the same about a horizontal axis through an arc either clockwise or counterclockwise. The cradle is driven by a motor. The recording unit includes a casette and a casette support in which is located part of a control unit. The casette includes a part which selectively operates switches controlling, at least partially, the taking of three-dimensional or action sequence X-rays. These switches select panels on a rotatable drum which are constituted by two groups respectively controlling operation of the cradle motor and the duration of the X-ray exposure. The aforesaid drum is driven by a motor through the intermediary of a slip clutch with which is associated a cam having the purpose of causing relative movement between a film and grid in the recording unit to provide for recording a sequence of exposures on adjacent strips of the film. The drum is either automatically operated or alternatively is stepped through a sequence of operations under manual or operator control.

3,671,746
STABLE, LOW LEVEL RADIATION MONITOR

Tom N. Thiele, Oconomowoc; Lester O. Gerlach, Muskego, and Thomas P. Gilmore, Wauwatosa, all of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed June 2, 1970, Ser. No. 42,739
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 R 12 Claims

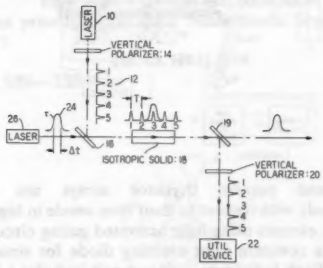


A radiation monitor has a low-loss integrating capacitor connected to be charged by the output of a radiation sensor, a high input impedance operational amplifier operating in the inverting mode connected across the integrating capacitor, and a reference voltage source applied to the noninverting input, whereby the operational amplifier is initially in positive saturation and switches to negative saturation when the charge across the capacitor equal the reference voltage. Means responsive to the negative saturation output of the operational amplifier are provided to discharge the integrating capacitor and to generate a pulse, and a pulse counter gives an indication of total radiation received by the sensor. A second high input impedance operational amplifier operating in the inverting mode has its inverting input connected to one electrode of the integrating capacitor and holds it at zero potential, and a current meter driven by the output of the second operational amplifier provides an analog indication of the current from the radiation sensor flowing through the integrating capacitor and is calibrated in roentgens per minute received by the sensor.

3,671,747
PICOSECOND OPTICAL APPARATUS UTILIZING OPTICALLY INDUCED BIREFRINGENCE IN SOLIDS

Michel Albert Duguay, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkely Heights, N.J.

Filed March 30, 1970, Ser. No. 23,849
Int. Cl. H04b *9/00*
U.S. Cl. 250—199 8 Claims

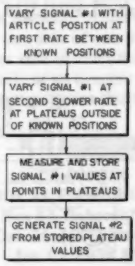


Birefringence, optically induced in solid materials by pulses of picosecond duration and high intensity, is utilized in a light gate, an amplitude modulator, a multiplexer and other optical devices.

3,671,748
METHOD AND APPARATUS FOR POSITIONER CALIBRATION SYSTEM

David Friedman, Framingham, Mass., assignor to Computervision Corporation, Burlington, Mass.

Continuation-in-part of Ser. No. 850,976, Aug. 18, 1969, Pat. No. 3,617,757. This application Aug. 24, 1970, Ser. No. 66,211
Int. Cl. G01j *1/20*; G05b *1/00*; G01b *11/26*
U.S. Cl. 250—201 18 Claims


VARY SIGNAL #1 WITH ARTICLE POSITION AT FIRST RATE BETWEEN KNOWN POSITIONS
VARY SIGNAL #1 AT SECOND SLOWER RATE AT PLATEAUS OUTSIDE OF KNOWN POSITIONS
MEASURE AND STORE SIGNAL #1 VALUES AT POINTS IN PLATEAUS
GENERATE SIGNAL #2 FROM STORED PLATEAU VALUES

A method and apparatus for automatically calibrating the position of a movable article between two reference positions

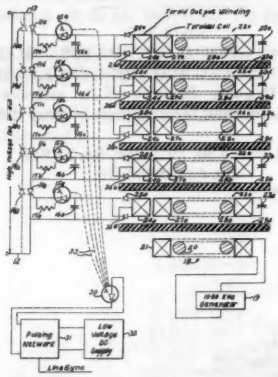
in terms of the output of an electrical position sensor. The method and apparatus are used in an article positioning system in which it is desired to precisely position the article at a preselected proportion of the distance between the reference positions. Variations in the sensing paths are compensated for by automatically registering the sensor outputs when the article is at each reference position and then interpolating other sensor values between these to obtain the article's position.

3,671,749

SIMULTANEOUS LIGHT TRIGGERING OF THYRISTOR ARRAYS

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company

Filed Feb. 17, 1971, Ser. No. 116,152
Int. Cl. H01j *39/12*
U.S. Cl. 250—208 **11 Claims**



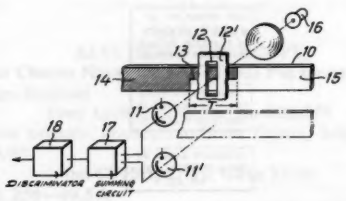
Series and parallel thyristor arrays are switched synchronously with respect to their own anode in high voltage a-c and d-c circuits using light activated gating circuitry controlled by a common light emitting diode for simultaneous triggering. Each individual gating circuit includes a light sensor device and an almost continuously available source of gating energy obtained from its own isolated power supply in the form of a tuned high frequency resonant circuit. The toroidal coils in each resonant circuit are coupled together and to a power coil. Non-magnetic unit gating circuit power supplies are also described.

3,671,750

METHOD OF SYNCHRONIZING THE CHANGE OF DIGITS IN ABSOLUTE-VALUE MEASURING DEVICES AND APPARATUS THEREFOR

Knut Heitmann, Wetzlar, and Eckart Schneider, Berghausen, both of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed July 20, 1970, Ser. No. 56,372
Claims priority, application Germany, July 29, 1969, P 19 38 377.8
Int. Cl. H01j *5/16*
U.S. Cl. 250—237 R **6 Claims**



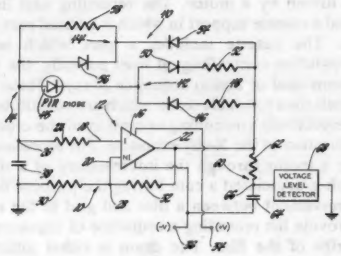
A method of synchronizing the change of digits in the indicator of absolute-value measuring devices. The method makes use of three possible electrical signals of different amplitude level obtained from scanning at least one track of markings subdividing the track to a certain degree of fineness, and of a control signal obtained from scanning a track of higher fineness. The combined signals control a threshold value discriminator of which the output signal is used for changing the digits. An apparatus for practicing the method comprises a displaceable record carrier having tracks of different degrees of fineness thereon with only one sensing means associated with each track. Each sensing means is connected to a summing circuit stage which, further, is in connection with the sensing means associated with the track of higher fineness. The summing circuit stage is, in turn, connected to the threshold value discriminator.

3,671,751

PHOTON ENERGY DETECTOR GENERATING SIGNAL IN WHICH DURATIONS OF FIRST AND SECOND HALF CYCLES ARE RESPONSIVE TO PHOTON ENERGY AND DIODE CONTINUITY RESPECTIVELY

Jerry W. Kortge, and James A. Rodaer, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 18, 1970, Ser. No. 73,501
Int. Cl. G01j *5/00*; G01k *7/00*; H01j *39/12*
U.S. Cl. 250—211 J **3 Claims**



A relaxation oscillator produces a cyclical output signal having alternate first and second half cycles. The oscillator includes a timing circuit having a resistance-capacitance network. The resistance includes a PIN photo diode which exhibits a reverse leakage current responsive to the photon energy incident upon the diode. The photo diode defines the duration of the first half cycles as a function of the reverse leakage current of the diode and defines the duration of the second half cycles as a function of the forward drive current of the diode. The first and second half cycles of the output signal are averaged to provide an output level having a magnitude which is responsive to the photon energy incident upon the photo diode and is responsive to the continuity of the photo diode.

3,671,752

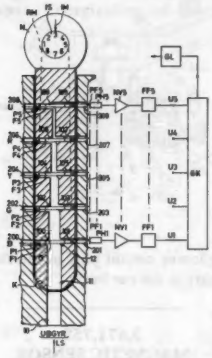
LOCKING DEVICE USING RADIATION CONDUCTING KEY

Sten-Lennart Bostrom, Box 607, Hagersten, Sweden

Filed Jan. 5, 1970, Ser. No. 5,420
Claims priority, application Sweden, Jan. 7, 1969, 154/69
Int. Cl. H01j *39/12*
U.S. Cl. 250—220 R **8 Claims**

Security locking device comprising mechanical locking means adapted to be electrically controlled, a source of laser radiation a plurality of opto-electrical transducers, a light con-

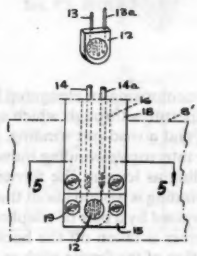
ducting key insertable into a mating key hole and arranged to thereby connect the source with the transducers for transmission of laser radiation thereto to open the mechanical locking means.



3,671,753
STACK SENSING SHEET FEED CONVEYOR CONTROL MEANS

Raymond L. R. Lucas, Avenue de La Republique, Prechac, Gironde, France

Filed April 29, 1970, Ser. No. 32,861
Int. Cl. G06m 7/00
U.S. Cl. 250—222 R 10 Claims



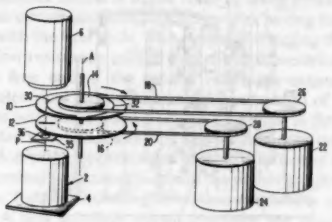
A stop plate is provided against which the forward edge of sheets discharged from a conveyor to form a stack impinge with a photoelectric cell being mounted in the stop plate for sensing the top of the stack to actuate a drive motor for sequentially lifting the discharge end of the conveyor as the height of the stack progresses.

3,671,754
SCANNING APPARATUS FOR BIOLOGICAL MICRODENSITOMETRY

Balaji Mundkur, Storrs, Conn., assignor to University of Connecticut, Storrs, Conn.

Filed June 18, 1968, Ser. No. 737,967
Int. Cl. H01j 5/16; G02f 1/30
U.S. Cl. 250—236 9 Claims

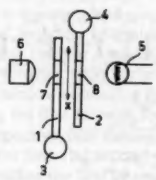
A scanning device that includes a pair of opaque members which rotate about a common axis and lie across the path of radiant energy where one member has a transparent area in the form of a straight line and the other member contains a transparent area in the form of a logarithmic spiral so that when the discs are rotated at different speeds they produce a scanning aperture of constant shape and configuration formed by the intersection of the transparent areas.



3,671,755
APPARATUS FOR ALIGNING TWO OBJECTS WHICH COMPRISES A SOURCE OF LIGHT, A PHOTOSENSITIVE DETECTION SYSTEM AND TWO PATTERN CARRIERS

Eerenst Frans Hovius, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 17, 1970, Ser. No. 73,135
Claims priority, application Netherlands, Sept. 24, 1969, 6914531
Int. Cl. H01j 3/14
U.S. Cl. 250—237 R 4 Claims



An apparatus for the relative alignment of two objects is described which comprises at least one light source, a photosensitive detection system and two carriers which are made of a translucent material or an opaque material and on which have been formed patterns of areas of an opaque material or a translucent material respectively. It is shown that a direct indication of the direction of a deviation is obtainable by using a special embodiment in which the patterns of the carriers each consist of two regular component patterns, one of the component patterns on one of the carriers being staggered with respect to the other component pattern on this carrier through a small distance in the direction of width of the areas, the region to one side of one of the component patterns and that to the other side of the other component pattern on this carrier being made of an opaque material, while with each of the said component patterns there is associated a separate detector.

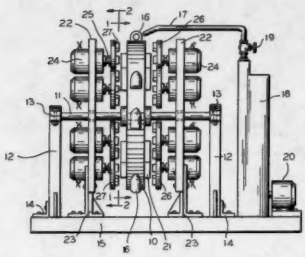
3,671,756
ELECTRICAL POWER GENERATOR

Emil S. Meier, P.O. Box 83, Babcock, Wis.

Filed Oct. 26, 1970, Ser. No. 84,047
Int. Cl. F03b 13/00
U.S. Cl. 290—54 3 Claims

An air driven wheel is magnetically coupled to drive a plu-

rality of electrical generators to generate electrical power responsive to the actuation of the wheel.

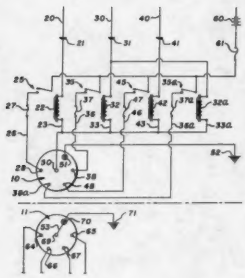


3,671,757

TRACTOR TRAILER LIGHTING SYSTEMS

John Ray Klein, Burnaby, British Columbia, Canada, assignor to Klein & Anderson Ltd., Vancouver, British Columbia, Canada

Filed June 1, 1970, Ser. No. 42,000
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 LS **11 Claims**



To protect the tractor lighting system from the effects of short circuits in the trailer lighting system the tractor and trailer lighting systems are separated. The tractor system includes a control element such as the coil of a relay and the trailer system a switching element operable by the control element.

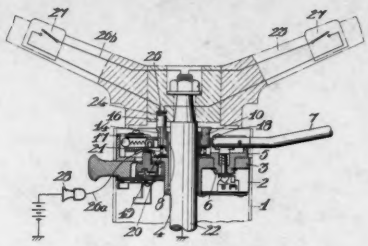
3,671,758

STEERING STRUCTURE CAPABLE OF SIMULTANEOUSLY COMPLETING A HORN CIRCUIT IN A MOTOR-CAR

Masaru Suzuki, Hekikai-gun, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Aichi-Prefecture, Japan

Filed Nov. 17, 1970, Ser. No. 90,357
Claims priority, application Japan, Nov. 17, 1969, 44/108964
Int. Cl. H01h *9/00*
U.S. Cl. 307—10 R **2 Claims**

A steering structure capable of simultaneously completing a horn circuit in a motor-car which comprises a cam cylinder rotatable with the steering wheel and having a cam with one or more cancelling projections for cancelling the turn signal indicator. A contact pin serves to couple the cam cylinder to the steering wheel for joint rotation therewith and also to electrically connect the lower circuit part in the steering wheel with the horn circuit part in the car body.

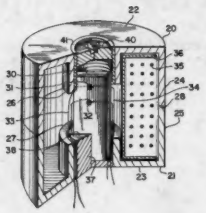


3,671,759

MAGNETIC SENSOR

Otto Walter Dopheide, Beaconsfield, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Sept. 2, 1970, Ser. No. 68,924
Int. Cl. H03k *17/82*
U.S. Cl. 307—88 R **5 Claims**



A ferrod sensor comprising an elongated ferrite stick having a pair of spaced apertures through which are threaded an interrogate winding and a read-out winding. Pulses or alternating current on the interrogate winding induce output pulses in the read-out winding as long as the ferrite stick is not saturated. A control winding is wound about the ferrite stick and is adapted to be energized by a pair of telephone lines, for example when the receiver is taken off the hook switch. This current causes saturation of the ferrite stick so that flux switching cannot take place and no pulses are induced in the read-out winding. The ferrite stick and its windings are placed within a ferromagnetic pot core thereby gaining higher sensitivity for the same amount of current as compared to known sensors as well as shielding from external magnetic fields. The device is very compact and a screw in one end of the pot core allows for varying the sensitivity of the device.

3,671,760

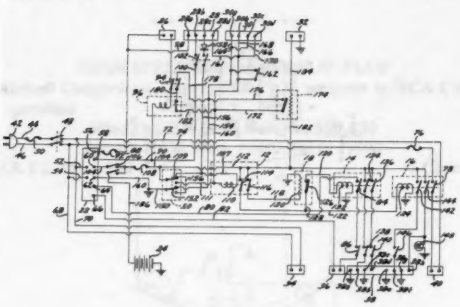
CONDITION MONITORING APPARATUS

Oliver W. Holmes, 3321 Rowena Drive, Los Alamitos, Calif.

Filed April 26, 1971, Ser. No. 137,204
Int. Cl. H01h *35/00*
U.S. Cl. 307—116 **6 Claims**

A condition monitoring apparatus for use by homeowners, small business operators and the like to provide a warning of unauthorized entry, fire, flooding, or other condition change. A variety of detection, sensor, and monitoring devices can be attached to the apparatus as inputs, including both parallel and series connected switches and independent monitoring systems. Certain of the input circuits incorporate a time delay

device to delay response to the apparatus to an input condition change. On actuation of the apparatus, a latching relay provides power to a pair of control relays. One control relay remains energized until the latching relay is reset, while the other control relay becomes de-energized after a predetermined time interval. Energization of the control relays is



adapted to apply power to various lighting, alarm and indicator devices attached to the apparatus as outputs. The apparatus permits selection of any of a variety of input and output devices to suit the apparatus to the needs of a particular user, with optional on-off control of certain input and output circuits.

3,671,761

SINGLE PULSE GENERATING CIRCUIT

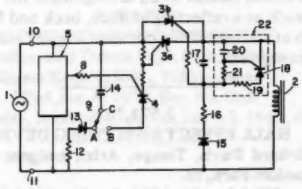
Koji Shibuya, and Teruhi Takano, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1971, Ser. No. 108,287

Claims priority, application Japan, Jan. 22, 1970, 45/6996

Int. Cl. H01h *47/32*

U.S. Cl. 307—106 **3 Claims**



Electronic switching apparatus employs oppositely poled, shunt connected thyristors selectively activated for energizing a load during only a single half cycle of an applied alternating current waveform. A stabilizing circuit is provided to suppress subsequent, repetitive thyristor conduction intervals which otherwise occur when the load exhibits a significant inductive reactance component.

3,671,762

THERMOSTAT SET

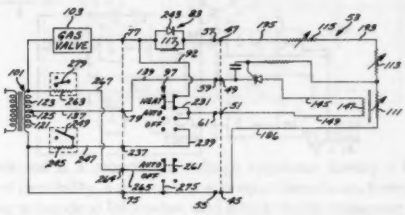
James Brooks, Hermosa Beach; Ralph E. Drummond, Cudahy; Frank J. Heinz, Garden Grove, and William W. Chambers, Anaheim, all of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed April 29, 1971, Ser. No. 138,440

Int. Cl. H01h *37/12*

U.S. Cl. 307—117 **12 Claims**

A thermostat set for selective connection with a center tap transformer and a temperature control device operator and to be selectively assembled to provide a thermostat with or without a control switch. The thermostat set includes a base including first through fourth electrical terminals and having a bridge circuit thereon which includes first and second resistance means formed with a node at their common end. The first resistance means is in the form of a temperature sensor. The base circuit includes rectifier means having its gate connected with the first node, lead means connecting the free end of the first resistance means with the first electrical terminal and the free end of the second resistance means with the second electrical terminal and the power circuit of the rectifier means with the third and fourth terminals. A first sub-base is provided which includes first and second input terminals for connection with opposite sides of said transformer and a third input terminal for connection with the center tap thereof, such sub-base further including first through fourth output terminals. A first sub-base circuit connects the respective first through third input terminals of such sub-base with the first



through third output terminals thereof and the second input terminal with the fourth output terminal thereof. A second sub-base also includes first through third input terminals and first through fourth output terminals and second sub-base circuit means connects the first through third input terminals with the respective first through third output terminals and the second input terminal with the fourth output terminal. The second sub-base circuit further includes switch means for breaking the circuit through such second sub-base. Electrically conductive mechanical connector means is provided for selectively connecting the first through fourth terminals in the sub-base with the respective first through fourth output terminals of the respective first and second sub-bases whereby a workman may select either the first or second sub-base for assembly with the base to thereby provide a thermostat with or without switch means depending upon the requirements of the particular installation.

3,671,763

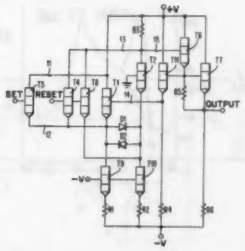
TERNARY LATCHES

Gerald A. Maley, Fishkill, and James L. Walsh, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1971, Ser. No. 112,935

Int. Cl. H03k *19/08*

U.S. Cl. 307—209 **9 Claims**



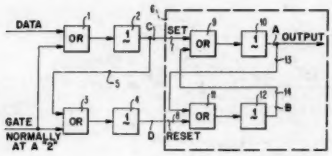
Two latch circuits are disclosed for three-state operation in the ternary mode. The set input may be raised to a 1 or inter-

mediate voltage level thereby providing a 1 level at the output which remains latched at that level after the set input is lowered to the 0 or lowermost level. When the set input is raised to the uppermost or 2 level the output is set at the 2 level and remains latched at that level when the set input is lowered to the 0 level. The circuits are reset to 0 by raising the reset input to the 2 level.

3,671,764
AUTO-RESET TERNARY LATCH

Gerald A. Maley, Fishkill, and James L. Walsh, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1971, Ser. No. 112,983
Int. Cl. H03k *19/00, 3/14*
U.S. Cl. 307—209 **13 Claims**

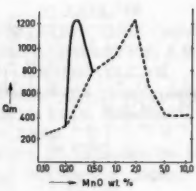


An auto-reset ternary latch has a data input line, a gate line and an output line. Each of said lines is adapted to assume any one of three potential levels. When the potential of the gate is lowered from the uppermost level to an intermediate level, the potential of the output line moves up or down one level to an intermediate value. When the potential of the gate is lowered all the way to the lowermost level, the potential of the output line matches that of the data input line. The potential of the output line is maintained at said value when the potential of the gate line is thereafter raised.

3,671,765
ELECTROMECHANICAL RESONATOR EMPLOYING PIEZOELECTRIC CERAMIC CONSISTING OF LEAD ZIRCONATE-TITANATE CONTAINING MANGANESE MONOXIDE

Karl Heinz Hardtl, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,414
Claims priority, application Netherlands, Oct. 7, 1969, 6915115
Int. Cl. H01v *7/00*
U.S. Cl. 310—9.5 **4 Claims**

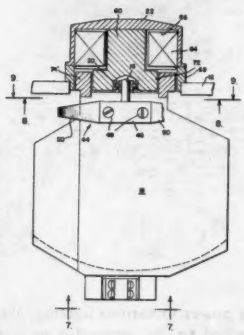


An electromechanical resonator having a ceramic piezoelectric member consisting of MnO-containing lead zirconate-titanate of the composition $Pb(Zr_xTi_{1-x})O_3 + y$ % by weight of MnO, where $x = 0.52 - 0.58$ and $y = 0.22 - 0.40$.

3,671,766
OSCILLATING MECHANISM

Spencer D. Howe, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 766,699, Oct. 11, 1968, abandoned.
This application June 29, 1970, Ser. No. 56,094
Int. Cl. H02k *33/18*
U.S. Cl. 310—39 **15 Claims**



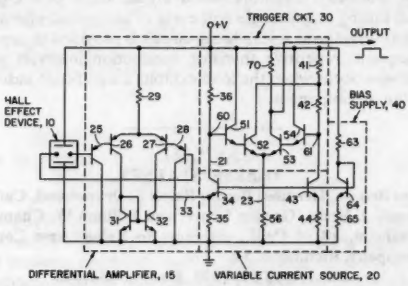
The invention teaches a mirror oscillating through an angular arc defined by arc terminal points. Springs associated with the mirror absorb the kinetic energy of halt at the terminal points and provide the primary driving force and energy to the mirror for reversing the direction of oscillation thereof toward the opposing terminal point. Magnetic means provides a source force to induce oscillation from dead stop and to supplement the spring action by compensating for frictional and other energy losses during operation. Means are provided to bias the mirror to one of the terminal positions when inoperative. The mirror is powered at each terminal point and freely moves at a substantially constant angular velocity between the terminal points.

This invention relates to an arrangement for oscillating an element, such as a reflecting surface, back and forth in an arcuate path at a substantially constant angular velocity through a major arc segment.

3,671,767
HALL EFFECT SWITCHING DEVICE

Walter Richard Davis, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 15, 1971, Ser. No. 106,865
Int. Cl. H01r *5/00*
U.S. Cl. 307—309 **10 Claims**



There is disclosed a Hall effect switching device involving the combination of a Hall effect device, a differential amplifier and a current control trigger circuit. The use of the differential amplifier in conjunction with the current control-trigger cir-

cuit amplifies the Hall effect voltage and permits the use of high hysteresis triggers. Control of the current control-trigger circuit is accomplished by a pair of current sources, the output of one of which is varied in response to the output of the differential amplifier. The trigger circuit is initially unbalanced in its OFF mode and is turned ON by the output of the amplifier reaching a predetermined high value. The trigger is turned OFF by the output of the differential amplifier returning to some specified low value.

3,671,768

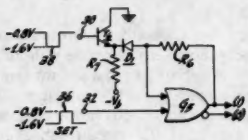
HIGH SPEED SET-RESET FLIP-FLOP

Michael Cooperman, Cherry Hill, N.J., assignor to RCA Corporation

Filed Oct. 31, 1966, Ser. No. 590,830

Int. Cl. H03k *3/26, 19/30;* **G11c** *19/00*

U.S. Cl. 307—289 **7 Claims**



A two input OR gate with resistive feedback between the output terminal and one of the input terminals of the OR gate. The second input terminal of the OR gate serves as s the set input terminal to the flip-flop and is normally maintained at a level indicative of a binary "0". To set the flip-flop, a voltage indicative of a 1 is momentarily applied to this set terminal. To reset the flip-flop, a voltage indicative of a zero is momentarily applied to the reset terminal of the flip-flop. The latter is coupled through a level shift circuit, including active element means, to the first input terminal of the OR gate.

3,671,769

EXPOSURE MEASURING DEVICE

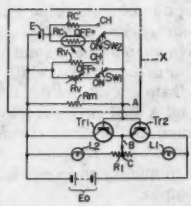
Toshio Tomomitsu, and Tatsuo Fujii, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 6, 1970, Ser. No. 865

Claims priority, application Japan, Jan. 10, 1969, 44/1684

Int. Cl. G01j *1/00*

U.S. Cl. 307—311 **8 Claims**



Exposure measuring device having means for compensating the variation of power source voltage. A feedback means is incorporated in the exposure measuring device so that upon switching the switches to the contacts for the compensation of the variation of the voltage of the power source, the compensation of the voltage is automatically affected and the proper exposure measuring is performed.

3,671,770

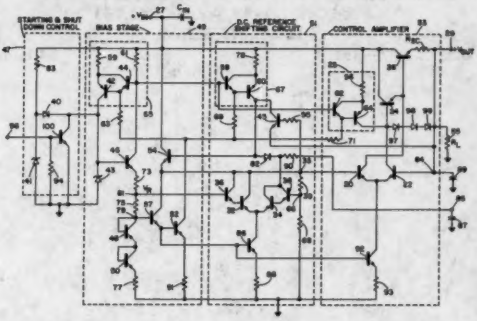
TEMPERATURE COMPENSATED BIAS CIRCUIT

Thomas M. Frederiksen, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Division of Ser. No. 701,235, Jan. 29, 1968, Pat. No. 3,538,424. This application Aug. 17, 1970, Ser. No. 64,549

Int. Cl. H03k *17/14*

U.S. Cl. 307—310 **6 Claims**



Disclosed is a monolithic voltage regulator having a high current capability, a constant low output impedance from DC to several hundred kilocycles, and a high ripple reduction factor. The regulator has excellent transient response; it provides a wide range of regulated output voltage and has a low temperature drift. The voltage regulator includes a voltage standard or bias source, an input differential amplifier stage having a pair of transistors coupled to a current sink (a current source passing current to ground), and one of the transistors in the pair is connected through a current gain stage to an output terminal. A DC reference shifting circuit is connected to the input of one transistor in the pair and provides a reference voltage to the differential amplifier stage which has been translated to provide the required voltage level at the output terminal. The output terminal is connected directly to the input of the other transistor in the pair in order to achieve a unity feed back factor to provide excellent constant loop performance independent of the output voltage. The direct coupled feedback connection eliminates any undesirable gain loss and phase shifting due to resistance in the input circuits of the differentially coupled transistor pair.

3,671,771

CHARGE AMPLIFIER FOR A BUCKET BRIGADE CAPACITOR STORE

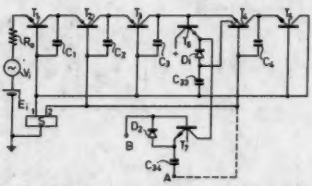
Frederik Leonard Johan Sangster, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 20, 1970, Ser. No. 65,367

Claims priority, application Netherlands, Sept. 6, 1969, 6913618

Int. Cl. H03k *17/26*

U.S. Cl. 307—293 **7 Claims**



A charge amplifier for a bucket brigade storage circuit uses two transistors, a pair of diodes and two auxiliary capacitors

connected in the charging path of one of the bucket brigade capacitors for amplifying the capacitor charge of the bucket brigade capacitor without reducing the permissible driving range of the bucket brigade storage circuit.

3,671,772

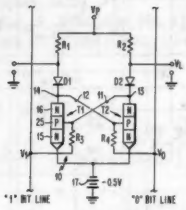
DIFFERENCE AMPLIFIER

Robert A. Henle, Hyde Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,703

Int. Cl. H03k *3/26*

U.S. Cl. 307—291 **8 Claims**



A difference amplifier used as a sense amplifier for stored binary data being read from a computer memory. The amplifier includes a pair of cross-coupled transistors, a power source providing an operating voltage for said transistors, and means for intermittently applying said power source to the cross-coupled transistors. Selective application means apply each of the pair of voltage signals to be differentiated from each other to a respective one of the pair of cross-couplings, i.e., the pair of cross-connected regions in the transistors. In the case of reading from binary storage, the voltage signals are applied from the pair of sense lines from the memory storage. The signals are applied during a period when the voltage source is not being applied and, consequently, both of the paired transistors are in the non-conductive state. The signals establish a stored charge in each of the transistors; the difference between these charges will determine which of the transistors assumes the conductive state when the power is subsequently applied.

3,671,773

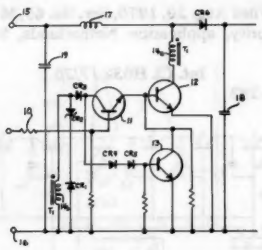
D.C. CONVERTER HAVING CONTROL TRANSISTOR IN BLOCKING OSCILLATOR FEEDBACK

Gilbert I. Cardwell, Jr., Peninsula, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed May 18, 1971, Ser. No. 144,478

Int. Cl. H03k *3/30*

U.S. Cl. 307—275 **2 Claims**



An apparatus for increasing an applied DC voltage level to a higher DC voltage level by utilizing a current feedback network to provide fast switching and control in the power transistors.

3,671,774

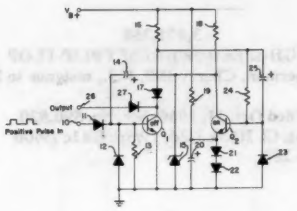
ZERO RECOVERY TIME TWO TRANSISTOR MULTIVIBRATOR

Sidney E. Millman, Van Nuys, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 28, 1970, Ser. No. 101,809

Int. Cl. H03k *3/26, 3/10*

U.S. Cl. 307—273 **9 Claims**



An improved two transistor monostable multivibrator having an extremely short retrigger time is disclosed. Recovery to the stable state is initiated by the abrupt removal of base current from the normally "off" transistor which causes that transistor to come out of saturation and revert back to its blocking state so that the circuit subsequently regenerates back to its stable state. Simultaneously, the normally "on" transistor saturates and the timing capacitor discharges via a very low impedance path. The discharge through the very low impedance path is responsible for the extremely fast retrigger time. Conversion of the multivibrator from monostable to astable operation is also disclosed.

3,671,775

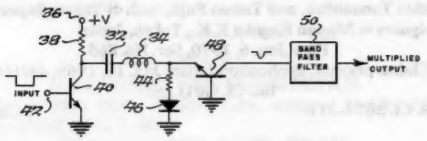
PULSE SHAPING CIRCUIT WITH MULTIPLIER APPLICATION

George H. Kam, Tonawanda, N.Y., assignor to Sylvania Electric Products Inc.

Filed April 27, 1970, Ser. No. 32,073

Int. Cl. H03k *1/10*

U.S. Cl. 307—271 **14 Claims**



A pulse shaping circuit comprising a series resonant circuit and a shunt resistor-diode damping circuit in combination with a square wave input and a grounded base transistor load to provide a pulse of controlled width and amplitude. The damping circuit dissipates all but the first half cycle of resonant circuit ringing. A dual circuit employs a parallel resonant circuit and common emitter load transistor. In a frequency multiplier application, the resonant circuit is tuned to the desired harmonic frequency and a bandpass filter is connected at the transistor output.

3,671,776

DIGITAL SIGNAL SYNCHRONIZING SYSTEM

Robert D. Houston, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

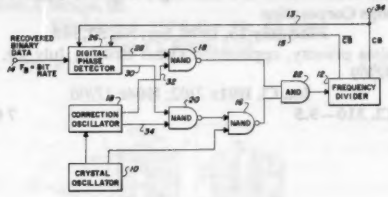
Filed May 1, 1970, Ser. No. 33,805

Int. Cl. H03k *5/00, 17/00*

U.S. Cl. 307—269 **1 Claim**

A digital signal synchronizing system wherein a locally generated timing signal is compared with received binary data.

If the timing signal lags the bit rate of the binary data, pulses are added to the timing signal and if the timing signal leads the binary data, pulses are deleted from the timing signal. Means



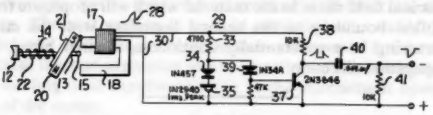
are provided for controlling the bandwidth of the system and the system, in addition, has a phase versus frequency response which is substantially constant over the range of operating frequencies.

3,671,777

FAST RISE TIME PULSE GENERATOR

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Warner, N.H.

Filed March 22, 1968, Ser. No. 715,372
Int. Cl. H03k 17/00
U.S. Cl. 307—268 **11 Claims**



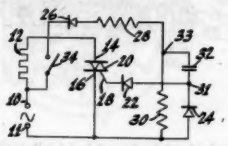
A device for generating fast rise time pulses, in which a mechanico-electric transducer translates mechanical operation or motion to a single electrical output pulse of relatively slow rise time characteristic for application to a semiconductive pulse shaper of monostable or bistable nature for producing a rapid rise time output pulse of the desired shape.

3,671,778

SWITCHING CIRCUITS

George D. Hanchett, Summit, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 590,320, Oct. 28, 1966, abandoned. This application Sept. 11, 1970, Ser. No. 71,389
Int. Cl. H03k 17/00
U.S. Cl. 307—252 B **13 Claims**



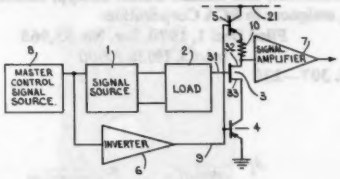
A bidirectional gate controlled device, such as a triac, is connected in circuit with a time constant circuit, an AC source, and a load. The time constant circuit is adapted to charge only when the AC source is of a given polarity; its discharge duration being sufficient to provide a triggering signal to the gate of the device to trigger it into consecutive conduction in both of its conducting directions.

3,671,779

FIELD EFFECT TRANSISTOR SWITCHING ARRANGEMENT FOR AMPLIFYING ONLY LOW LEVEL SIGNALS

James Krishen Draper, Farnham, and David Michael Chick, Bracknell, both of England, assignors to International Computers Limited, London, England

Filed Dec. 21, 1970, Ser. No. 100,023
Claims priority, application Great Britain, Jan. 28, 1970, 4,054/70
Int. Cl. H03k 17/16, 17/60
U.S. Cl. 307—251 **8 Claims**



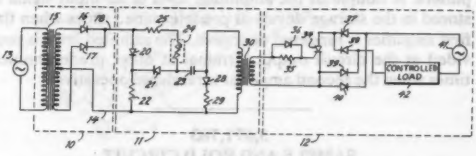
An output amplifier is fed from a load via a F.E.T. pre-amplifier included in switching means for disabling conduction of F.E.T. pre-amplifier during application of certain input signals to the load.

3,671,780

CONTROL CIRCUITS

Peter Lefferts, Hopewell, N.J., assignor to Heinemann Electric Company, Lawrence Township, N.J.

Filed Nov. 24, 1969, Ser. No. 879,173
Int. Cl. H03k 17/00
U.S. Cl. 307—252 UA **14 Claims**



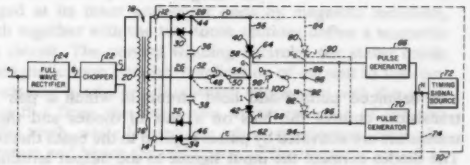
Circuits for generating a control pulse in response to a change in an external condition, by charging a capacitor from a pulsating direct current source over a substantial part of the source pulsation and discharging the capacitor rapidly near the zero crossover point of the pulsation. Subsequently the control pulse is applied to a power switching device, in particular the cathode terminal of a controlled rectifier.

3,671,781

WAVEFORM RESTORER CIRCUIT

Donald W. Shute, Burlington, Mass., assignor to Spacetac Incorporated, Burlington, Mass.

Filed July 8, 1970, Ser. No. 53,086
Int. Cl. H03f 3/38; H03k 5/13, 17/56
U.S. Cl. 307—252 W **10 Claims**



Apparatus is disclosed including a waveform restoring circuit for extracting portions of a fundamental waveform from a

composite waveform and combining those portions to reproduce the fundamental waveform, including means for producing a series of pulses from the composite waveform, each pulse representing a portion of the fundamental waveform, switching means for selectively conducting the pulses and synchronized control means for driving the switching means to conduct the pulses in a predetermined pattern for reconstructing the fundamental waveform.

3,671,782

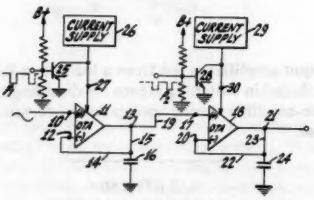
SAMPLE-HOLD AND READ CIRCUIT

Harold Allen Wittlinger, Pennington; Carl Franklin Wheatley, Jr., Somerset, and Russell Daniel Knapp, Somerville, all of N.J., assignors to RCA Corporation

Filed Dec. 1, 1970, Ser. No. 93,965

Int. Cl. H03k *17/00*

U.S. Cl. 307—238 **6 Claims**



A sample and hold circuit using a first and second operational transconductance amplifier with a voltage storing device connected in circuit between the first and second amplifiers. A sample of the amplitude level of an input signal is stored in the storage device at predetermined times when the first amplifier is rendered operative. The sampled level is provided at the circuit output terminal at other predetermined times when the second amplifier is rendered operative.

3,671,783

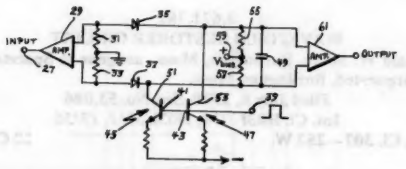
SAMPLE AND HOLD CIRCUIT

Daniel Hampel, Westfield, and Joseph Bryan Lerch, North Brunswick, both of N.J., assignors to The United States of America as represented by the Secretary of the Air Force

Filed June 15, 1971, Ser. No. 153,309

Int. Cl. B03k *5/00*; H03k *5/20*

U.S. Cl. 307—238 **2 Claims**



A balanced sample and hold circuit in which a pair of transistors control the bias on a pair of diodes and these transistors are activated by pulses applied to the bases thereof. The diodes connect the input signals to the output terminals and there is a holding capacitor in shunt with the output terminals. Resistors are connected across the input terminal to provide a load when the circuit is in the off condition.

3,671,784

PIEZO-ELECTRIC TRANSDUCERS HAVING VARIABLE SENSITIVITY BETWEEN THE BOUNDARIES OF THE PIEZO-ELECTRIC CRYSTAL

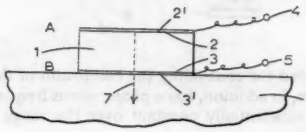
Richard Frank Mitchell, Cambridge, England, assignor to U.S. Philips Corporation

Filed July 23, 1970, Ser. No. 57,549

Claims priority, application Great Britain, July 29, 1969, 38,052/69

Int. Cl. H01v *7/02*; H04r *17/00*

U.S. Cl. 310—9.5 **7 Claims**



An acoustical transducer having an improved electrical impedance at the lower end of the useful acoustical passband comprises a body of material in which a stress is produced by the application of a magnetic or electrical field. The body of material has a first boundary substantially free of acoustical boundary, a second boundary acoustically matched to an acoustic wave transmission media and means for producing an electrical field stress in the material which will propagate from the first boundary to the second boundary with the stress decreasing in a substantially continuous manner along the propagation direction.

3,671,785

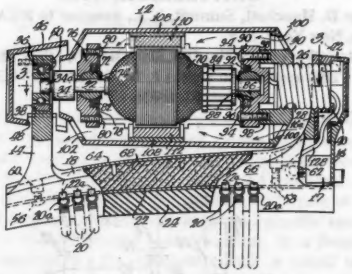
ELECTRIC VIBRATORY MASSAGER

Richard C. Fuchs, Milwaukee; Daniel L. Sukow, Grafton, and Dennis P. Wilke, Milwaukee, all of Wis., assignors to Oster Corporation, Milwaukee, Wis.

Filed July 12, 1971, Ser. No. 161,483

Int. Cl. H02k *7/06*

U.S. Cl. 310—50 **16 Claims**



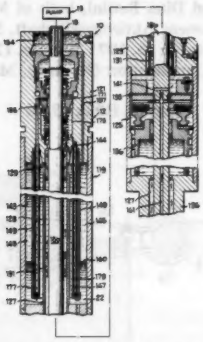
An improved electric hand-held vibratory massager is disclosed in which the brush holders for the massage are made of plastic, and the connectors for supplying electricity to the brushes are integrally molded into the plastic brush holders. The input power line is connected to the base of the massager and the electrical leads from the brush holders to the base pass through the vibratory spring that supports the motor on the base and then down through the standard that supports the spring whereby the amount of strain that the lead wires to the brushes must withstand is substantially reduced.

3,671,786

MOTOR AND SEAL SECTION UTILIZING A FLUORINATED ETHER AS A SINGLE, HOMOGENOUS, BLOCKING COOLING AND LUBRICATING FLUID

Johnny W. Jones, Tulsa, Okla., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed July 6, 1970, Ser. No. 52,490
Int. Cl. H02k 5/12
U.S. Cl. 310—87 5 Claims



A submersible motor and seal section containing a homogeneous lubricating and cooling fluid which, in addition, concurrently blocks the entry of ambient well fluid into the motor. The seal section is in fluid communication with the motor and with the ambient well environment. It accommodates thermal expansion and contraction of the lubricating and cooling fluid experienced due to the intermittent operation of the motor.

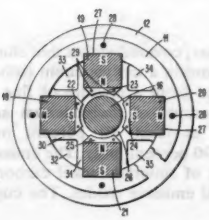
The fluid possesses essential properties of thermal conductivity, dielectric strength, lubricity, compatability with other motor component materials, and immiscibility with well fluid to provide lubrication and cooling of the motor and effective resistance to contamination by ambient well fluid.

3,671,787

LAMINATED DYNAMOELECTRIC MACHINE HAVING NONMAGNETIC LAMINA FOR STRUCTURAL SUPPORT

Christopher C. Herron, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 16, 1971, Ser. No. 171,821
Int. Cl. H02k 21/26
U.S. Cl. 310—154 14 Claims



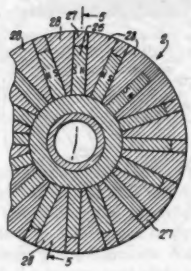
A permanent magnet dynamoelectric machine whose housing is formed by a plurality of continuous nonmagnetic lamina which support a plurality of discontinuous magnetic lamina in cooperative relation to permanent magnets. The nonmagnetic lamina structurally defines the machine housing and includes lamina cavities to hold the magnets. The nonmagnetic lamina includes other lamina portions which mount the discontinuous magnetic lamina in cooperative relation to the magnets to define the magnetic flux path and the working air gap.

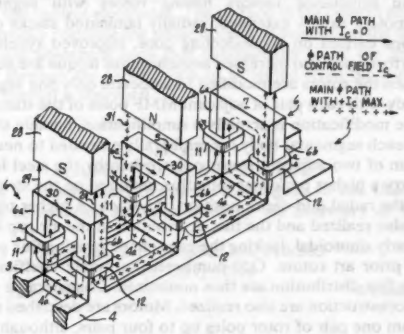
3,671,788

REGULATABLE ALTERNATOR

Louis I. Knudson; Richard C. Frink, both of Norwich, and Charles H. White, Earlville, all of N.Y., assignors to General Laboratory Associates, Inc., Norwich, N.Y.

Filed Nov. 30, 1970, Ser. No. 93,582
Int. Cl. H02k 21/14
U.S. Cl. 310—156 12 Claims





An alternator comprising a permanent magnet rotor constructed to retain circumferentially polarized permanent magnets in place without substantial stress on the magnet material.

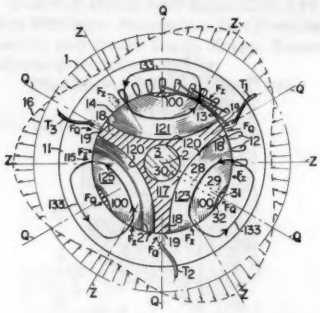
A stator cooperating with the rotor is constructed to permit regulation of the alternator output by the use of a control winding which may saturate part of the magnetic circuit in the stator.

The magnetic structure of the stator includes an annular magnetic circuit means with inwardly projecting teeth. Each tooth is separated into at least two axially separated radial branches. The annular magnetic circuit means and the teeth define magnetic return circuits for the flux from the poles on the rotor. Each pair of axially spaced tooth branches is bridged at its inner and outer ends by magnetic members, which together with the two tooth sections define a magnetic loop circuit. The control winding encircles the stator inside the magnetic loop circuits. Application of current to the control winding produces a flux which cooperates with the alternating flux from the rotor pole to saturate one of the two parallel teeth, while leaving the other unsaturated. Thus, the saturation and hence the reluctance of the magnetic circuit in the stator is controlled but there is always present an unsaturated magnetic return circuit interrupted only by the air gaps at the stator periphery.

3,671,789
SYNCHRONOUS RELUCTANCE MOTORS HAVING ROTOR SEGMENTS OF EXTENDED POLE SPAN

Robert W. Menzies, Winnipeg, Manitoba, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Jan. 19, 1971, Ser. No. 107,640
Int. Cl. H02k *19/06*
U.S. Cl. 310—163 8 Claims

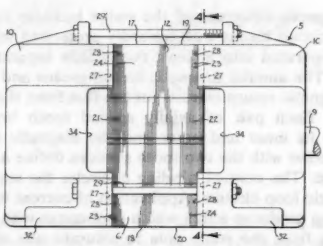


In reluctance motors having rotors with segmentally disposed, axially extended, radially laminated stacks of steel strips carried on a conducting core, improved synchronous performance and increased asynchronous torque are achieved when the rotors are modified to associate only one segmental body with each pair of adjacent MMF poles of the stator field. The modification is actually a simplification, namely the span of each segmental body is peripherally extended to nearly the span of two adjacent stator poles, whereby the steel laminae carry a higher peak magnetic flux centered on the strips lying at the radial mid-depth position of a stack. A higher total flux is also realized and the flux distribution in the air gap is more nearly sinusoidal, lacking the gaps characterizing flux patterns of prior art rotors. Odd-numbered harmonic coefficients of the flux distribution are thus minimized. Considerable savings in construction are also realized. Motors are described ranging from one pair of rotor poles up to four pairs, although the invention extends to any practicable higher pole numbers.

3,671,790
LOW-SHAFT, LOW-PROFILE ELECTRIC MOTOR

John C. Widstrand, Wausau, Wis., assignor to Marathon Electric Manufacturing Corporation, Wausau, Wis.

Filed April 26, 1971, Ser. No. 137,268
Int. Cl. H02k *1/26*
U.S. Cl. 310—216 8 Claims

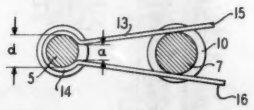


A two-pole induction-run motor can have asymmetrical poles at opposite sides of a horizontal plane on its axis. All stator core laminations are identical, generally octogonal in outline, with straight, parallel top and bottom edges, straight side edges, and intermediate edge portions curved on a uniform radius about the motor axis. The end bells have uniplanar shoulders, normal to the bearing axis, that engage the flat end surfaces of the stator core and have axially inward tongue-like projections that snugly engage the rounded surfaces on the stator core for end bell and bearing coaxiality.

3,671,791
WIPER AND SLIP RING ASSEMBLY

Erwin Muller, and Dino Bettini, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed March 16, 1971, Ser. No. 124,706
Claims priority, application Germany, March 20, 1970, G 70 10 427.7
Int. Cl. H02k *13/00*
U.S. Cl. 310—219 3 Claims

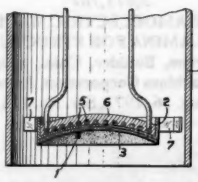


Synchro sliding springs of hairpin shape, the closed end of which is in the form of a ring that surrounds the greater part of its supporting pin and whose elastic opening is a little smaller than the actual diameter of the support pin.

3,671,792
FAST WARM-UP INDIRECTLY HEATED CATHODE STRUCTURE

Clayton L. Waltermire, Easton, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 29, 1969, Ser. No. 872,323
Int. Cl. H01j *1/20, 19/14*
U.S. Cl. 313—337 8 Claims



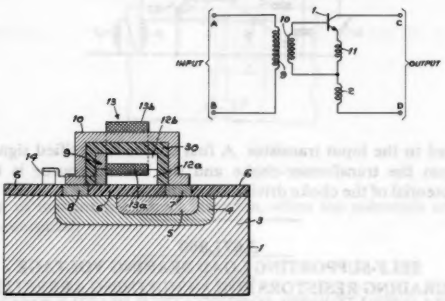
A tungsten heater, covered with a thin alumina layer (about 1 mil), is potted inside a molybdenum cathode cup in a sintered mass formed from a mixture of fine particles (of the order of 1–5 microns) of molybdenum and nickel in the weight ratio of at least 40 percent molybdenum, but preferably about 90 percent moly. The emissive surface of the cup has a matrix of sintered nickel carbonyl filled with alkaline earth metal emissive oxides. The cup is supported by invar struts.

The processing includes: (1) preparing a sintered nickel carbonyl matrix layer for the emissive surface of the cup; (2) ball-milling molybdenum-nickel mix with butyl carbitol, and after covering the heater therewith, inserting the heater in the cup, firing the assembly in hydrogen at between 1,150° to 1,350° C until sintered; and (3) impregnating the nickel carbonyl matrix with a mix of alkaline earth carbonates in methyl alcohol and using heat and ultrasonic vibration to compete impregnation. After assembly in tubes, activation and aging follows.

3,671,793
HIGH FREQUENCY TRANSISTOR STRUCTURE HAVING AN IMPEDANCE TRANSFORMING NETWORK INCORPORATED ON THE SEMICONDUCTOR CHIP

Robert M. Scarlett, Palo Alto, Calif., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 16, 1969, Ser. No. 858,257
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R 7 Claims

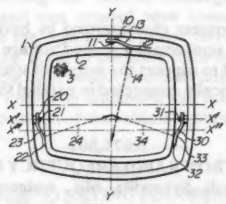


This is a semiconductor component having an active semiconductor device formed within a substrate, and an impedance transforming network incorporated on said substrate and coupled to said device so as to reduce the effect of the device lead inductance which is common to both a circuit input and output.

3,671,794
SHADOW MASK SUPPORT MECHANISM FOR A COLOR TELEVISION IMAGE TUBE

Hiroto Nakamura; Akira Sato, both of Takatsuki, and Ken-ichi Doi, Kobe, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed March 20, 1970, Ser. No. 21,422
Claims priority, application Japan, March 24, 1969, 44/24045
Int. Cl. H01j *29/06, 31/20*
U.S. Cl. 313—85 S 1 Claim

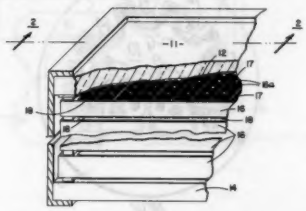


A shadow mask support means including three leaf springs for supporting a rectangular shadow mask on a face panel at three sides of a frame of the mask, said three leaf springs having a predetermined relationship with respect to the spring constant and deflection so that, even when the image tube is subjected to a shock load or the shadow mask in thermally expanded, the change in the relative position of the shadow mask and the face panel is minimized.

3,671,795
HIGH CONTRAST DISPLAY FOR ELECTRON BEAM SCANNER

Lester A. Jeffries, Palos Verdes Peninsula, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Aug. 28, 1970, Ser. No. 67,711
Int. Cl. H01j *1/70, 63/02*
U.S. Cl. 313—109 4 Claims

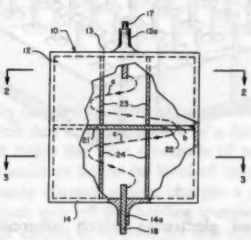


An electron beam scanner has a broad surfaced target and an area cathode with control electrodes sandwiched therebetween for controlling the electron flow between the cathode and the target. The target comprises a transparent plate member having a phosphorescent coating thereon which emits light through the transparent plate in response to electrons incident thereon, electrons being passed from the cathode to the target through channels formed by alined apertures in the control electrodes. The surface of the control electrode directly opposite the phosphorescent coating on the target is light absorbent such that substantially all of the light passing through the target plate or reflected from the outer surface thereof is absorbed.

3,671,796
PLASMA ARC FLASH SOURCE

Anthony P. Passamante, Oreland, Pa., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 27, 1971, Ser. No. 110,203
Int. Cl. H01j *61/04*
U.S. Cl. 313—204 4 Claims



A plasma arc flashtube for flash photography comprises a tube divided into an upper and lower cylindrical chamber by a disc having a peripheral aperture. Arcuate upright partitions in each chamber define a spiral inductive path leading from a central upper electrode through the upper and lower chambers terminating at a central lower electrode.

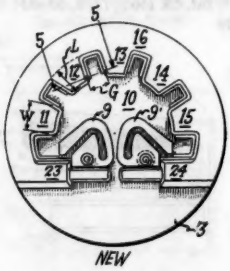
3,671,797
SPARKGAP CHAMBER WITH ARC STRETCHING TEETH EMBODYING OPTIMUM HEAT SINK MEANS

Earl W. Stetson, Pittsfield, Mass., assignor to General Electric Company

Filed March 15, 1971, Ser. No. 124,347
Int. Cl. H01j *29/84*
U.S. Cl. 313—325 9 Claims

A sparkgap assembly for a surge voltage arrester is provided with arc-elongating teeth and arcing chamber wall means that,

in combination, afford an optimum heat sink arrangement for cooling and extinguishing arcs formed therein by sparkover of the arrester. The characteristic heat sink means of the assembly operates to stabilize its mechanical and thermal



characteristics so that the re-seal voltage of the arrester is increased without developing excessive arrester arc voltage, thus, affording performance characteristics that were not possible with prior art sparkgap assemblies.

3,671,798

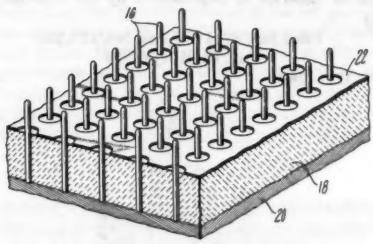
METHOD AND APPARATUS FOR LIMITING FIELD-EMISSION CURRENT

Wayne L. Lees, Lexington, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Continuation of Ser. No. 763,744, Sept. 30, 1968, abandoned. This application Dec. 11, 1970, Ser. No. 97,343

Int. Cl. H01j *1/16, 19/10*

U.S. Cl. 313—336 **10 Claims**



Self-protected electrodes which inherently limit field-emitted currents to a safe value and also stabilize such currents are disclosed. The electrodes are characterized by a plurality of columnar conductors connected at one end to a common potential source. The electrodes are insulated from one another along their lengths whereby the effective or exposed surfaces thereof are subdivided into a mosaic of conducting patches which are insulated from one another.

3,671,799

TELEVISION RECEIVERS UTILIZING TRANSISTORS CONNECTED AS A DARLINGTON PAIR

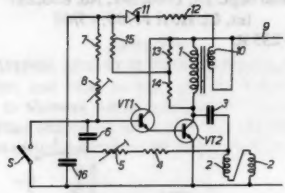
William Thomas Edwards, Harrow, and James Kirwan, Northwood, both of England, assignors to Communications Patents Limited

Filed Jan. 5, 1970, Ser. No. 566

Int. Cl. H01j *29/70*

U.S. Cl. 315—27 TD **6 Claims**

A transistorized vertical deflection circuit for television receivers is disclosed, where two transistors are connected as a Darlington pair to drive a d-c coupled deflection transformer-choke arrangement and the scan coils. To linearize the scan and control its amplitude two sources of variable d-c are cou-



pled to the input transistor. A first source is rectified signals from the transformer-choke and the second source is the potential of the choke driving transistor.

3,671,800

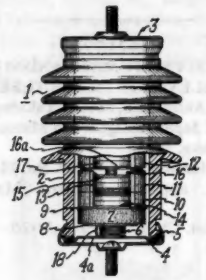
SELF-SUPPORTING LOAD BEARING VOLTAGE GRADING RESISTORS FOR A LIGHTNING ARRESTER

Earl W. Stetson, Pittsfield, Mass., assignor to General Electric Company

Continuation of Ser. No. 813,501, April 4, 1969, abandoned. This application Jan. 11, 1971, Ser. No. 105,724

Int. Cl. H01t *5/04*

U.S. Cl. 315—36 **3 Claims**



A lightning arrester characterized by having a plurality of self-supporting, semi-annular shaped voltage grading resistors that are adapted to support the weight of spark gap assemblies which are electrically connected in parallel therewith.

3,671,801

MAGNETRON RAPID FREQUENCY CHANGER

Roland C. Masek, Sykesville, Md., assignor to The United States of America as represented by the Secretary of the Navy

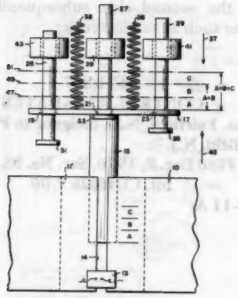
Filed March 25, 1971, Ser. No. 128,103

Int. Cl. H01j *25/50*

U.S. Cl. 315—39.55 **6 Claims**

A magnetron is rapidly tuned over a wide bandwidth by inserting and withdrawing a conductive tuning element in an anode cavity. The conductive element is mounted on a plate which is moved in increments by a plurality of solenoids. A stop is mounted on the solenoids and each solenoid when actuated pulls the plate an incremental distance. The plate, when actuated by a single solenoid slides along the other sole-

noid rods in the solenoid array. A spring pushes the plate against the force of the solenoids and returns the plate to position of maximum element insertion, when the solenoids are de-energized.

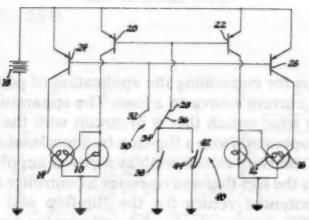


3,671,802

VEHICLE HEADLIGHT CONTROL CIRCUIT USING AN AUXILIARY CONTACT ON THE DIMMER SWITCH

Richard P. Ballou, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1971, Ser. No. 113,138
Int. Cl. B60q *1/06*
U.S. Cl. 315—83 **2 Claims**



A solid state vehicle lighting control circuit having two control wires connecting the vehicle headlights to the foot dimmer switch and one control wire connecting the foot dimmer switch to the light switch which turns on the vehicle lights by grounding. A set of normally open contacts in parallel with the vehicle light switch is closed during actuation of the foot dimmer switch to illuminate the vehicle lights independently of the position of the vehicle light switch.

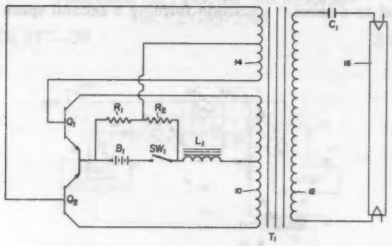
3,671,803

PORTABLE SELF-STARTING FLUORESCENT LAMP

Frank E. Hoxsie, 8616 S. Atlanta, Tulsa, Okla.

Filed Jan. 28, 1970, Ser. No. 6,342
Int. Cl. H05b *41/29*
U.S. Cl. 315—99 **1 Claim**

A portable fluorescent lamp including a DC to AC inverter powered by a conventional 12-volt battery utilizing a saturating-type switching transformer having a core which produces a square-loop hysteresis effect. An inductance is provided in the primary winding of the transformer which is connected in circuit with the inverter and a capacitor is provided in series in the secondary with the fluorescent tube. No special starter filaments are needed. The combination of the inductance in the primary and the capacitor in the secondary provide sufficient power for igniting the fluorescent tube while, at the same time, limiting the current through the tube after ignition.

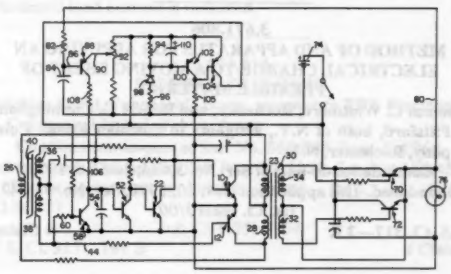


3,671,804

VARIABLE DUTY CYCLE SWTICHING CIRCUIT

Richard D. Church, Candor, N.Y., assignor to American Standard Linear Systems, Inc., Candor, N.Y.

Filed June 25, 1970, Ser. No. 49,802
Int. Cl. G05f *1/58*
U.S. Cl. 315—127 **16 Claims**



A magnetically coupled multivibrator is normally prevented from running free due to the presence of a forwardly biased transistor which holds the base electrode of one of the two multivibrator transistors below its level of base-emitter conduction. A variable current source charges a capacitor to a voltage level which cuts off the holding transistor and allows the multivibrator circuit to operate for one cycle, during the latter part of which cycle the capacitor is dumped so that the successive cycles are separated in time by that time necessary to charge the capacitor to the required level and which time is variable according to the charging current. The variable duty cycle thus obtained for the multivibrator circuit controls a voltage or power source whose output is fed back inversely to control the charging current so that a regulated voltage or power output is produced.

3,671,805

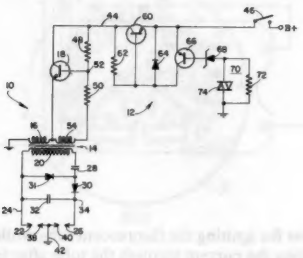
IGNITION SYSTEM

Gunter G. Schuette, Addison, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 9, 1970, Ser. No. 1,807
Int. Cl. H05b *37/02*
U.S. Cl. 315—209 **4 Claims**

An ignition system includes a step-up transformer wherein the primary winding is connected to an oscillator circuit to

receive pulses of direct current voltage at a relatively high frequency to cause corresponding high voltage pulses to be developed in the secondary winding thereof. One end of the secondary winding is coupled to a first electrode forming a first spark gap and the other end of the secondary winding is coupled to a second electrode forming a second spark gap,



and each of the spark gaps includes a common potential electrode. The output of the secondary is accumulated in a high voltage capacitor until a sufficiently high voltage is obtained to cause simultaneous spark discharges at both spark gaps. A voltage regulator circuit is connected in series with the pulsing circuit to regulate the voltage supplied thereto, which, in turn, controls the rate of spark discharge between the spark gaps.

3,671,806

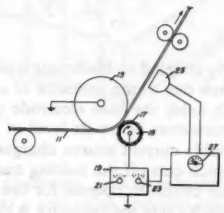
METHOD OF AND APPARATUS FOR APPLYING AN ELECTRICAL CHARGE TO A MOVING SHEET OF FLEXIBLE MATERIAL

Thomas C. Whitmore, Rochester, and Robert G. Cunningham, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 3,434, Jan. 16, 1970, abandoned. This application Nov. 20, 1970, Ser. No. 91,342

Int. Cl. H05f *3/00*

U.S. Cl. 317—2 R **4 Claims**



A sheet of flexible material such as photographic film or paper is passed between a pair of rollers of electrically conducting material. One roller is connected to ground, and there is applied to the other roller a direct current voltage of magnitude and sign such as to develop a desired electrical charge condition on the sheet. Advantageously, the other roller has a soft yielding coat thereon of an electrically partially conducting material such as surfactant-treated plush cloth which improves contact with the sheet and prevents sparking if the two rollers should come into contact with one another. The sheet can be in the form of a continuous web or an individual sheet of small dimensions which has been chopped from a web. The electrical charge on a sheet can be monitored by an electrostatic field meter or volt meter, and the sign and magnitude of the applied voltage can be regulated to maintain the desired charge condition. When the sheet of flexible material has a coating of electrically conductive material such as carbon, aluminum, silver or gold on one side it is not necessary to employ the grounded roller adjacent to the charged roller. Instead, the charged roller engages a first side of the sheet opposite the second side carrying the electrically conductive coating, and the second side subsequently passes over a grounded roller such as an idler roller.

3,671,807

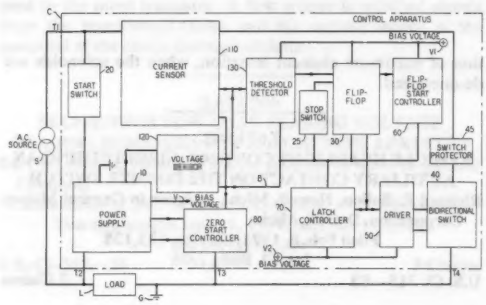
CONTROL APPARATUS

Lee J. Milligan, Fairfield, N.J., assignor to Peripheral Systems Corp., Fairfield, N.J.

Filed Dec. 7, 1970, Ser. No. 95,579

Int. Cl. H02h *7/00*

U.S. Cl. 317—11 A **8 Claims**



Apparatus for controlling the application of power from an alternating current source to a load. The apparatus includes a high power triac switch that is in circuit with the source and the load is operated from a flip-flop by a low level start switch. Closure of the start switch enables a power supply which applies bias to the flip-flop and operates a controller to provide a common potential return for the flip-flop and other constituents when the magnitude of the alternating current source signal is below a prescribed level. This triggers the triac to establish a low impedance path between the source and the load. Excess voltage and current conditions are sensed to cause a change in states of the flip-flop and turn off the triac switch when either an overcurrent or an overvoltage condition is encountered.

3,671,808

ATTACHMENT FOR MAGNETIC STARTERS TO PROTECT THREE-PHASE ELECTRIC MOTORS

Frank C. Martin, 2325 North 70th Avenue, Omaha, Nebr.

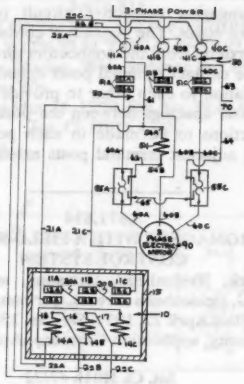
Filed Sept. 18, 1970, Ser. No. 73,532

Int. Cl. H02h *7/085*

U.S. Cl. 317—13 R **2 Claims**

This invention provides a small, simple and extremely inexpensive electric motor protector that can be quickly attached and become a part of the circuitry of a conventional magnetic starter, and can thus exert an on/off control over the magnetic starter and the 3–phase electric motor to which said magnetic starter is connected under certain conditions. By the arrangement and connection of two or more magnetic relays which are the components of this electric motor protector, it allows the electric motor to run as long as all three power phases are actively available to the magnetic starter. In the event that any one of the three power phases is lost, due to a blown fuse or

other problem, all three phases are shut off, as is the electric motor. As a result, this motor protector positively eliminates



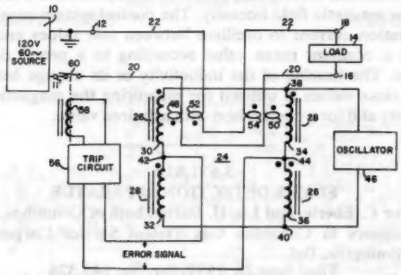
dangerous and destructive single-phasing of the motor (operation on the two remaining phases).

3,671,809

GROUND FAULT DETECTOR INCLUDING MAGNETIC AMPLIFIER BRIDGE MEANS

John T. Ryan, Hyde Park, and Jeffrey D. Ingalls, Lynn, both of Mass., assignors to GTE Sylvania Incorporated

Filed Nov. 1, 1971, Ser. No. 194,391
Int. Cl. H02h *3/16*
U.S. Cl. 317—18 D **13 Claims**



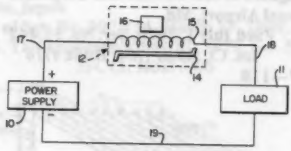
A protective device for detecting abnormal leakage current to ground in an electrical circuit energized through two or more conductors connected to an AC source, one of the conductors being grounded at the source. The device comprises a magnetic amplifier having a pair of reactor cores upon which a plurality of gate windings are arranged to form a balanced inductance bridge. An oscillator is connected across the bridge to apply a carrier signal at a frequency many times higher than the frequency of the AC source, and the bridge output is connected through a peak detector and amplifier to drive the solenoid of a circuit breaker. Each supply line conductor of the monitored circuit is wound about both the reactor cores with the sense of each windings being arranged to provide a net magnetic flux of zero when equal currents are flowing through each conductor. In this manner the magnetic amplifier provides at the bridge output a null signal during normal current conditions and an error signal voltage in the presence of a current imbalance between the conductors.

3,671,810

SATURATED CORE TRANSIENT CURRENT LIMITER

Lell E. Barnes, N. Caldwell, N.J., and David Morris, Brooklyn, N.Y., assignors to The Singer Company, New York, N.Y.

Filed Sept. 18, 1969, Ser. No. 859,025
Int. Cl. G05f *3/06*
U.S. Cl. 317—20 **5 Claims**



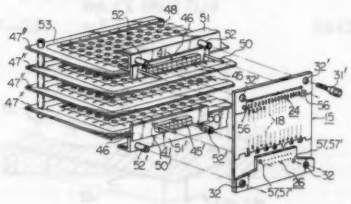
A transient current limiting device which includes a saturated core reactor having its windings in circuit with a power supply and a load. The magnetic core is biased into saturation for normal load currents and driven out of saturation by abnormally high transient load currents, such as currents caused by semiconductor loads which have been irradiated by high energy electromagnetic radiation. In one embodiment, the reactor comprises a magnetic core in the form of a wound toroid which exhibits a square loop hysteresis curve and includes a permanent magnet for biasing the core into saturation. A number of configurations are disclosed for placement of the permanent magnet relative to the core to saturate the magnetic element. The invention also permits automatic resetting of the magnetic flux density in the core to saturation when the abnormal load current is removed.

3,671,811

DIODE MATRIX CARD

Joichiro Ezaki, Funabashi, Japan, assignor to TDK Electronics Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 856,058, Sept. 8, 1969, abandoned. This application June 30, 1971, Ser. No. 158,453
Claims priority, application Japan, Sept. 16, 1968, 43/80727
Int. Cl. H05k *1/04*
U.S. Cl. 317—101 D **4 Claims**



A coupling system of the diode matrix card to the memory assembly plane. The diode matrix card including a number of diodes loaded at a high density on a surface of an insulating base board and a printed circuit for inter connecting on the other surface selective ones of the diodes, as well as a grounding pattern plated on at least a surface of the boards as spaced from the printed circuit, is provided with a pair of connector-pin groups on a base board surface respectively connected to the printed circuit. A pair of separate connector means are preliminarily mounted to the memory assembly plane so as to be connected to memory driving lines in the memory matrix. A pair of grounding frame means are also mounted to the assembly plane substantially at the same position as the connector means. The diode matrix card is mounted to the grounding frame means with fixing screws so that the grounding pattern and the connector pin groups on the card are electrically con-

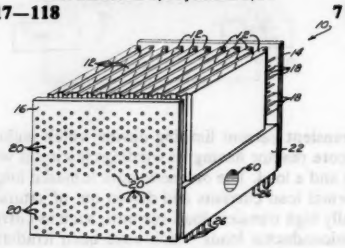
nected to the grounding means and the connector means on the assembly plane side simultaneously.

3,671,812

HIGH DENSITY PACKAGING OF ELECTRONIC COMPONENTS IN THREE-DIMENSIONAL MODULES

Raymond F. Peluso, and Richard F. David, both of Littleton, Colo., assignors to Martin Marietta Corporation, Friendship International Airport, Md.

Filed July 1, 1970, Ser. No. 51,442
Int. Cl. H02b 1/04; H05k 1/14
U.S. Cl. 317—118 **7 Claims**



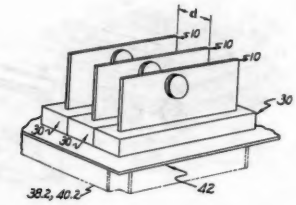
A high density three-dimensional package of flatpacks in which the flatpacks are stacked in a cordwood configuration and in which rigid pins carried at opposite ends of each flatpack are plugged into appropriate sockets in circuit boards in a pressure fit relationship. A double right angle connector is also plugged into the circuit boards. Each of the flatpacks may be removed, replaced or repaired by merely unplugging it from the circuit boards. A combined housing and heat sink is also disclosed.

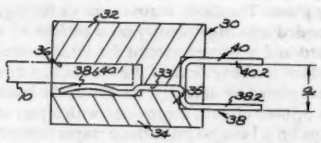
3,671,813

PANEL BOARD SYSTEM AND COMPONENTS THEREOF WITH CONNECTOR AND INTEGRATED CIRCUIT DEVICE

Russell E. Wilcox, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 10, 1970, Ser. No. 96,809
Int. Cl. H05k 1/07
U.S. Cl. 317—118 **6 Claims**





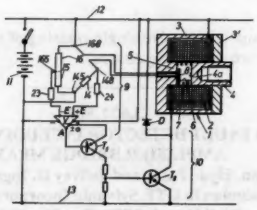
A panel board system detachably mounts medium scale integrated circuit devices in connectors on a panel board in a manner which provides improved device density on the board while permitting the device circuits to be electrically interconnected by inexpensive wire-wrapping techniques. The integrated circuit devices have an integrated circuit chip mounted on a ceramic card and electrically connected to printed circuit paths on the card, the circuit paths terminating with small center-to-center spacings between the paths along an edge of the card. The connectors receive edges of the cards and have contacts on small center-to-center spacings detachably engaging respective circuit path terminations along the card edges. The connector contacts have terminal posts which extend from the connectors through panel board apertures, the contact terminal posts extending in a selected staggered relation to each other to provide sufficiently large center-to-center spacings between the posts to permit wire-wrap connections to be made to each post without interference with adjacent terminal posts extending through the panel board.

3,671,814

ELECTROMAGNET WITH A FIELD-RESPONSIVE CONTROL SYSTEM

Heinrich Dick, Heidenheim, Germany, assignor to Voith Getrieb KG, Heidenheim (Brenz), Germany

Filed April 22, 1971, Ser. No. 136,397
Claims priority, application Germany, April 22, 1970, P 20 19 345.7
Int. Cl. H01h 47/32
U.S. Cl. 317—123 **7 Claims**



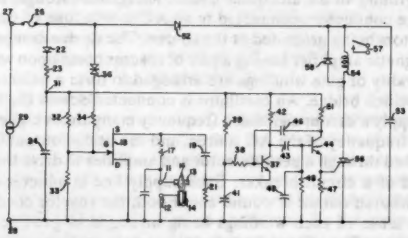
In an electromagnet, to generate a force which is independent from the armature position, an on-off control system for the excitation current is provided which operates as a function of the magnetic field intensity. The control system causes the excitation current to oscillate between two values and thus have a constant mean value according to a preset desired value. The timelag of the inductivity or its change between two close values is utilized for measuring the magnetic flux density and for a comparison with a desired value.

3,671,815

FLAME DETECTION APPARATUS

Arthur C. Eberle, and Lee H. Darby, both of Columbus, Ohio, assignors to Columbia Gas System Service Corporation, Wilmington, Del.

Filed June 20, 1972, Ser. No. 143,326
Int. Cl. H01h 47/26
U.S. Cl. 317—133.5 **5 Claims**



A gas flame produces a voltage between the burner and an electrode in the flame. This voltage is utilized in a circuit

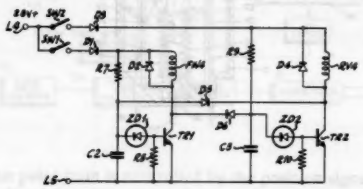
which produces a pulse signal to control a relay that indicates flame presence. Failure of any critical component in the circuit prevents the relay from operating.

3,671,816

TIME DELAY CONTROL SYSTEM FOR DIRECTIONAL RELAYS WITH ELECTRICAL INTERLOCK

Gerald R. Ritzow, Racine, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed May 21, 1970, Ser. No. 39,414
Int. Cl. H01h 47/22
U.S. Cl. 317—136 3 Claims



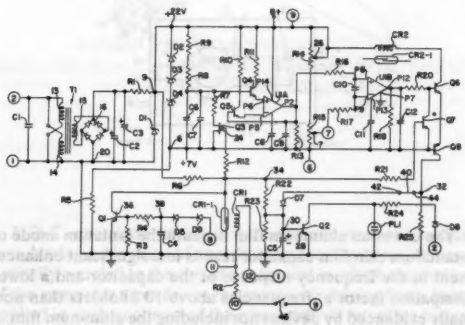
A solid state control circuit for completing selectively energizing circuits for the operating coils of directional relays in a motor control system which affords a predetermined time delay on energization for each relay, and electrical lockout against simultaneous energization of one relay operating coil while the other remains energized and vice versa.

3,671,817

HIGH ACCURACY SOLID STATE TIMER

William H. Seipp, Bettendorf, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 33,851, May 1, 1970, abandoned. This application Dec. 28, 1970, Ser. No. 101,598
Int. Cl. H01h 47/18
U.S. Cl. 317—141 S 20 Claims



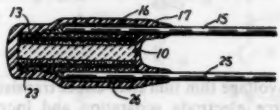
A timer circuit consists of a resistance-capacitor charging network with an adjustable potentiometer providing a predeterminable comparison voltage according to the length of time desired and operational amplifier connected as a comparator between the capacitor and the potentiometer providing current gain and high input impedance to prevent loading the capacitor. The non-inverting input of the operational amplifier is coupled to the capacitor and the output of the operational amplifier is fed back to the inverting input of the operational amplifier. A field-effect transistor is provided for discharging the capacitor to zero at the end of the timing cycle in order to avoid the effect of discharge potential difference of other types of discharge devices. A supplemental circuit is provided for illuminating a pilot light precisely during the time that the charging cycle is going on.

3,671,818

SEMICONDUCTIVE CERAMIC CAPACITOR

Minoru Chiba, Kyoto, Japan, assignor to Nichicon Capacitor Ltd., Kyoto, Japan

Division of Ser. No. 807,734, March 17, 1969, Pat. No. 3,570,113. This application July 27, 1970, Ser. No. 64,886
Int. Cl. H01l 7/06
U.S. Cl. 317—230 3 Claims



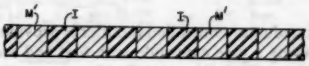
A semiconductor ceramic capacitor having a thin layer containing copper on at least one surface portion of a substrate formed of N-type barium titanate containing a small quantity of a rare earth element and a coating containing frit, lead, and powdered silver or silver oxide with the lead, silver and copper being diffused into said substrate and a conductive layer on another surface portion of said substrate to form said capacitor. The invention further provides a method of manufacturing the foregoing capacitor which is made by applying said copper layer and said layer containing frit, lead, and silver in overlying relationship and heating said substrate and layers in an oxidizing atmosphere.

3,671,819

METAL-INSULATOR STRUCTURES AND METHOD FOR FORMING

John G. Swanson, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1971, Ser. No. 109,846
Int. Cl. H01l 7/24
U.S. Cl. 317—234 16 Claims



Metal-insulator structures and methods for forming such structures wherein a substrate comprising a metallic material, which in the presence of an electrolyte under anodic conditions forms a porous oxide coating, such as aluminum, is completely anodized at selected areas to form insulating areas through the substrate. Also backing layers and masking layers comprising a material which forms a passivating coating in the presence of the electrolyte under anodic conditions, such as titanium, may be deposited on the substrate for controlling the anodization process.

ERRATUM

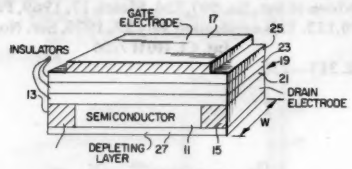
For Class 317—235 see:
Patent No. 3,671,793

3,671,820

HIGH VOLTAGE THIN-FILM TRANSISTOR

Rudolph R. Haering, 647 Croydon Place, North Vancouver, British Columbia, Canada, and John F. O'Hanlon, RD 1, Box 41, Birdsall Dr., Yorktown Heights, N.Y.

Filed April 27, 1970, Ser. No. 32,252
Int. Cl. H01l 5/06, 3/00, 3/20
U.S. Cl. 317—235 R 14 Claims



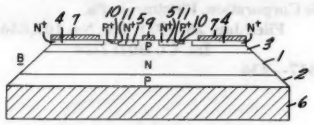
A high-voltage thin film field effect transistor has increased drain-source electrode separation and increased insulating layer thickness to avoid breakdown at high voltages. The insulating layer contains an electron-depleting film and an electron-enhancing film so that the offset voltage may be kept sufficiently low. The surface of the semiconductor layer opposite that in contact with the insulating layer is contacted by an electron-depleting layer to avoid shunt current conduction via this surface.

3,671,821

SEMICONDUCTOR CONTROLLED RECTIFIER INCLUDING TWO EMITTER REGIONS

Josuke Nakata, and Ryuji Denda, both of Itami, Hyogo Prefecture, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1971, Ser. No. 147,909
Claims priority, application Japan, June 2, 1970, 45/47392
Int. Cl. H01l 9/12
U.S. Cl. 317—235 4 Claims



A semiconductor controlled rectifier is provided on its main surface having a gate electrode with first and second emitter layers separated from one another by a common base layer. The second emitter layer is disposed between the first emitter layer and the gate electrode. The device further comprises a high impurity concentration semiconductor layer of the opposite semiconductivity type to that of the second emitter layer. The high impurity concentration layer is disposed between the first and second emitter layers and adjacent to the second emitter layer.

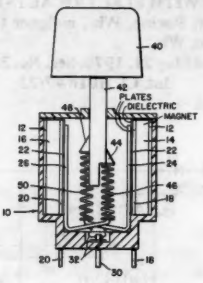
3,671,822

VARIABLE CAPACITIVE APPARATUS

Theodore M. Leno, Arlington Heights, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 17, 1970, Ser. No. 99,186
Int. Cl. H01g 5/10
U.S. Cl. 317—249 R 18 Claims

A variable capacitance apparatus particularly adapted for use with a manually-operated keyboard and having two parallel, conductive plates with a dielectric therebetween. Depression of a key moves one conductive plate farther from the other conductive plate so as to reduce the capacitive coupling between the conductive plates, in order to determine whether the key has been depressed.

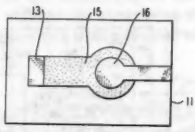


3,671,823

THIN FILM CAPACITOR INCLUDING AN ALUMINUM UNDERLAY

Raymond Charles Pitetti, Wescosville, and Walter Worobey, Center Valley, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 1, 1971, Ser. No. 158,788
Int. Cl. H01g 1/01
U.S. Cl. 317—258 6 Claims



The use of an aluminum film beneath the tantalum anode of a tantalum thin film capacitor results in a significant enhancement in the frequency response of the capacitor and a lower dissipation factor at frequencies above 10 kilohertz than normally evidenced by devices not including the aluminum film.

3,671,824

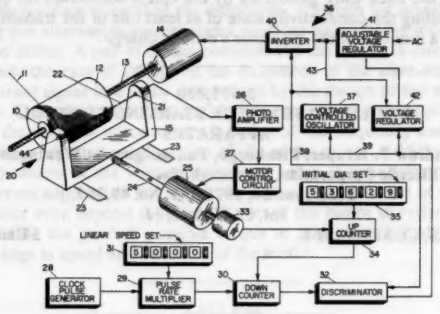
SPEED CONTROL SYSTEM FOR A ROTATING ELEMENT OF CHANGING DIAMETER

Edward H. Dinger, Waynesboro, Va., assignor to General Electric Company

Filed Dec. 3, 1970, Ser. No. 94,756
Int. Cl. B65h 59/38
U.S. Cl. 318—6 8 Claims

A photoelectric sensing assembly is used to monitor the diameter of material accumulating on a windup bobbin. The sensing assembly physically tracks the changing diameter and in so doing generates position signals representing the diame-

ter. A digital system generates a pulse train for controlling the speed of rotation of the bobbin drive means and the repetition



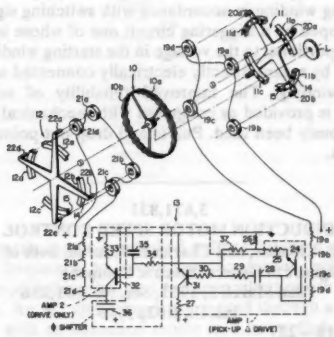
rate of this pulse train is controlled by the position signals and prescribed peripheral speed input data.

3,671,825

TIMING MOTOR WITH RESONANT MEMBERS

William W. Allison, Melville, N.Y., assignor to Armec Corporation, Huntington Station, N.Y.

Filed Aug. 7, 1970, Ser. No. 62,104
Int. Cl. H02k *33/00*
U.S. Cl. 318—128 **19 Claims**



A D.C. energized timing motor with one or more resonators, having a plurality of coordinately moving arms, all magnetically coupled to the rim of a rotor and in which the motion of the resonator arms drives the rotor with driving force being applied in each quadrant of the rotor without retarding torque and in which the magnetic coupling between rotor and resonator is at no time released.

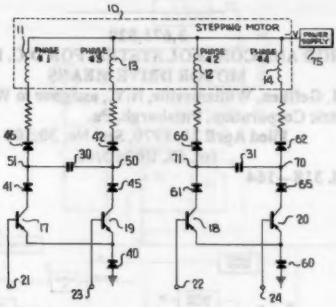
3,671,826

STEPPING MOTOR DRIVER

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corp., Warner, N.H.

Filed Sept. 11, 1969, Ser. No. 857,158
Int. Cl. H02k *37/00*
U.S. Cl. 318—138 **6 Claims**

A driver circuit for controlling the excitation of windings of a multiphase stepping motor according to a sequential switching format includes a plurality of phase activation circuits each associated with a respective one of the windings. The activation circuits are coupled together in pairs and contain active elements arranged to perform in the manner of a flip-flop in response to the switching format so that first one and then the other excites its respective winding in complementary fashion, in that when one of the windings associated with the pair of activation circuits is on, the other is off, and



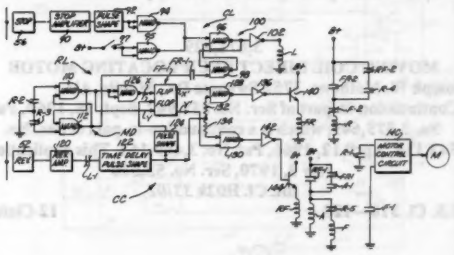
vice versa. An electrical energy storage device is associated with and coupled to each pair of activation circuits for storing energy from the power supply and from the collapsing magnetic field of the de-energized winding, and for supplying the stored energy to the windings in the proper sequence during predetermined portions of the switching format, thereby raising the average current to the windings and the torque on the shaft.

3,671,827

DIRECTION REVERSING CONTROL FOR A MACHINE CONTROL SYSTEM

Richard G. Foley, Dayton, and James E. Murray, University Heights, both of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Nov. 27, 1970, Ser. No. 93,375
Int. Cl. G05b *19/02*
U.S. Cl. 318—162 **17 Claims**



A machine control system, such as a control for a paper cutting machine, is provided for purposes of reversing the direction of travel of a movable member, such as a back gauge in a paper cutting machine, driven by a reversible motor between forward most and rearward most positions relative to a work station. A control record has two spaced marks recorded thereon for defining the forward most and rearward most positions. A mark sensor serves to sense the marks and in response to each mark provides a reverse signal pulse. Relative motion is provided between the control record and the sensor proportional to the velocity of the movable member. A memory is actuated to one of two stable states in dependence upon the direction the movable member is traveling when a

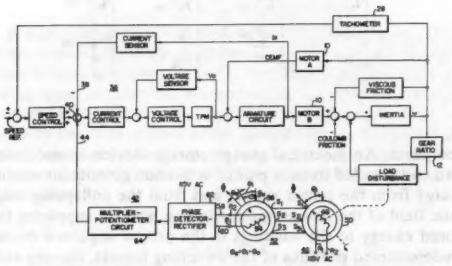
reverse mark is sensed. The commanded condition of the memory together with the occurrence of a reverse signal pulse generated in response to the sensed reverse mark, causes the motor to reverse and drive the movable member in the opposite direction. In addition, circuitry is provided to prevent the motor from reversing in response to a reverse mark when the movable member is traveling in a backward direction until a position command signal, also recorded on the control record, is sensed by a second sensor.

3,671,828

METHOD AND CONTROL SYSTEM FOR D.C. ELECTRIC MOTOR DRIVE MEANS

John H. Geffken, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 21, 1970, Ser. No. 30,500
Int. Cl. H02p *5/06*
U.S. Cl. 318—164 **4 Claims**



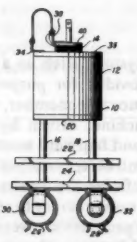
This disclosure relates to a method and a control system for a d.c. electric motor drive coupled to an oscillating load for the dual purposes of regulating the periodic velocity of the oscillating load in conformance with a predetermined function, and for the purpose of controlling the magnitude of the velocity excursion. A first component of armature current is applied to the electric motor drive for maintaining the motor speed constant, independently of cyclic perturbations in the load, and a second component of armature current is applied to the drive motor to provide a periodically variable disciplinary torque to compel the velocity excursions of the load to comply with the predetermined velocity patterns.

3,671,829

MOVING COIL DIRECT RECIPROCATING MOTOR

Joseph W. Mathews, 3752 Swansea Dr., Mobile, Ala.

Continuation-in-part of Ser. No. 858,942, Sept. 18, 1969, Pat. No. 3,575,649, which is a continuation-in-part of Ser. No. 542,116, April 12, 1966, Pat. No. 3,469,163. This application July 9, 1970, Ser. No. 53,510
Int. Cl. H02k *33/02*
U.S. Cl. 318—128 **12 Claims**



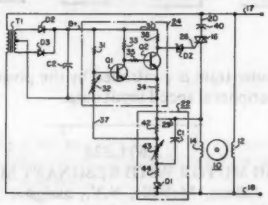
A direct current reciprocating motor having a coil moving in a magnetic field and a circuit for controlling the flow of current through the coil from a d.c. source in accordance with an alternating flux produced by reversal of direction of current flow through the coil to produce reciprocating movement of the coil. A capacitor whose state of charge varies as a function of the back EMF generated by the coil is connected for controlling the conductivity state of at least one of the transistors as a function of the capacitor's state of charge.

3,671,830

SINGLE PHASE MOTOR STARTING CONTROL APPARATUS

Andrew P. Kruper, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1970, Ser. No. 49,397
Int. Cl. H02p *1/44*
U.S. Cl. 318—221 E **5 Claims**



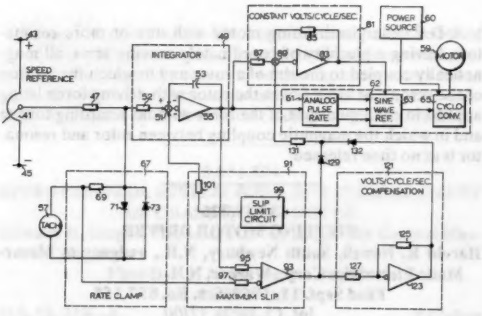
A starting circuit for a single phase electric motor, particularly a capacitor start motor, is provided that includes a solid state switch connected in series with the motor starting winding and the capacitor for controlling the supply of power to the starting winding in accordance with switching signals that are developed by a triggering circuit one of whose inputs is a signal proportional to the voltage in the starting winding and is produced by means directly electrically connected across the starting winding. The improved reliability of solid state switching is provided as compared with mechanical relays as has previously been used. Pull in and drop out points may be readily set.

3,671,831

INDUCTION MOTOR SPEED CONTROL

Burnette P. Chausse, and Charles E. Konrad, both of Roanoke, Va., assignors to General Electric Company

Filed March 5, 1971, Ser. No. 121,256
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **6 Claims**



A control circuit for regulating the speed of a polyphase induction motor by changing the frequency and voltage level of

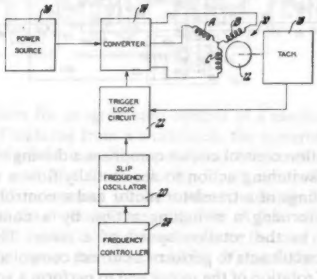
the supply source supplying power to the motor. The difference between a speed reference signal and an output signal from a closed loop feedback circuit is converted to a sine wave alternating current signal having a frequency which varies with the time integral of the difference. A circuit for amplifying this alternating current signal provides power to the induction motor. A pair of diodes connected in the feedback circuit limits the rate of change of the frequency of the alternating current signal to a value determined by the design of the motor. The voltage amplitude of the alternating current supplied to the motor is adjusted as a function of the frequency and is further adjusted as a function of slip of the motor. Additional adjustment of the volts/cycle/second value of the alternating current supplied to the motor allows for overexcitation of the motor even beyond the design limits of the motor in order to provide the greatest possible torque to maximize the rate of change in speed and direction of the motor.

3,671,832

SUPPRESSION OF TORQUE MODULATION IN ELECTRIC MOTOR DRIVE SYSTEMS BY FREQUENCY CONTROL

Jalal T. Salihi, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 6, 1971, Ser. No. 140,843
Int. Cl. H02p 7/42
U.S. Cl. 318—231 **2 Claims**



An electric motor is supplied voltage having a continually varying frequency to obviate cyclic torque pulsations or torque modulation observed to cause vibrations in the motor and load. An AC alternator is connected through a frequency changer with an induction motor in a controlled slip motor drive system including a continually varying slip frequency signal to shift the slip frequency in relation to a nominal value to prevent cyclic torque pulsations. The slip frequency is varied at a rate such that the rotor and load operate at the nominal slip, being incapable of following the changes in input frequency.

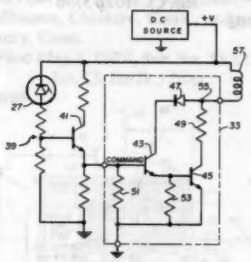
3,671,833

BI-LEVEL ELECTRONIC SWITCH IN A BRUSHLESS MOTOR

Rodney G. Rakes, Bristol, Tenn., assignor to Sperry Rand Corporation

Filed June 24, 1970, Ser. No. 49,413
Int. Cl. H02k 29/00
U.S. Cl. 318—254 **1 Claim**

An electronic switch for driving a load capable of operating in high or low current states includes a pair of transistors arranged in a modified Darlington circuit for switching power to the load. The input and output transistors of the pair are coupled through a diode and adjusted so that the diode is back-biased when the load is in its normal low current condition, but forward-biased when the load requires a high current. With the diode back-biased, the output transistor saturates at a low voltage level and thus provides a minimum switch power



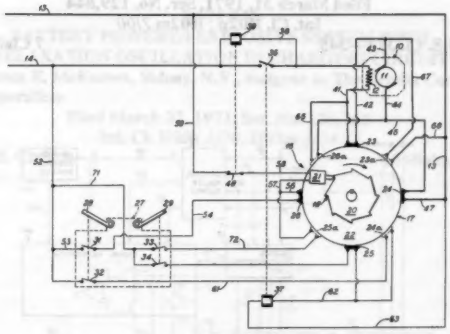
loss at the normal operating point. With the diode forward-biased, however, the switch provides high current capability for driving the load in the high current state.

3,671,834

REVERSER PROTECTIVE CIRCUIT

Roger M. Buckeridge, Downers Grove, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed March 9, 1970, Ser. No. 17,599
Int. Cl. H02h 7/097
U.S. Cl. 318—293 **7 Claims**

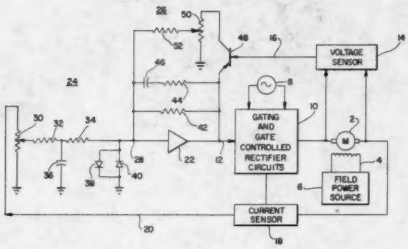


A motor reverser protective electrical circuit for a reversible motor or motors in which a control relay is employed to prevent energization of a reverser activating control circuit whenever the motor is under load. This circuit protects against "throwing" the reverser, primarily in the event a main line relay contactor, supplying power to the motor, is stuck or welded closed.

3,671,835
MOTOR SPEED CONTROL WITH DROOP COMPENSATION

Frederick McMenamy, Bethel Park; Louis A. De More, and Ludwig E. Del Mastro, both of Pittsburgh, all of Pa., assignors, to North American Rockwell Corporation, Pittsburgh, Pa.

Filed July 9, 1970, Ser. No. 53,520
Int. Cl. H02p 5/06
U.S. Cl. 318—308 **6 Claims**

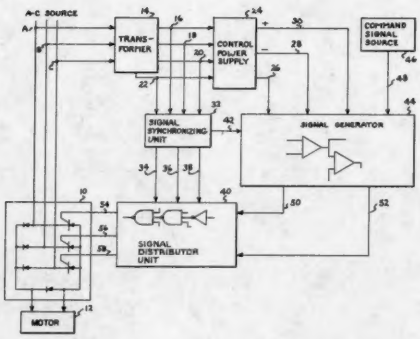


Compensating for droop in load-speed characteristic of a DC motor, an armature current signal, which is indicative of motor load, is amplified to control armature voltage. A negative feedback reduces amplification as armature voltage increases. An operational amplifier has an input related to armature current and a negative feedback responsive to armature voltage. A transistor in the feedback path varies the feedback impedance as a function of armature voltage.

3,671,836
POWER CONVERSION CONTROL SYSTEM

Edwin E. Kolatorowicz, Erie, and Werner K. Volkmann, Fairview, both of Pa., assignors to General Electric Company

Filed March 31, 1971, Ser. No. 129,844
Int. Cl. H02p ; H02m 7/00
U.S. Cl. 318—345 **7 Claims**

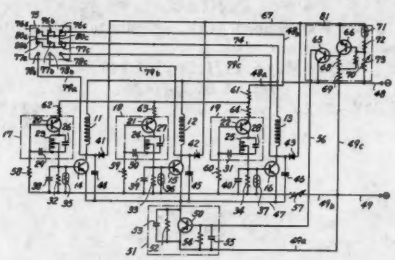


A static power conversion system for converting alternating current electric power to direct current power by means of controllable rectifiers is provided with control apparatus for controlling the firing angle of the controlled rectifier. The control apparatus generates a command signal proportional to a desired level of direct current power output, internal signal trains at various frequencies and timings determined at least in part by the frequency of the alternating current input wave form and the magnitude of the command signal, and output trains of firing pulses for delivery to the controllable rectifiers, the timing of the firing pulses being determined by the magnitude of the control signal.

3,671,837
ROTATION CONTROL CIRCUIT FOR TRANSISTOR MOTOR

Satoshi Kanno, Yamato, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Kanagawa-ku, Japan

Filed Oct. 20, 1970, Ser. No. 82,295
Claims priority, application Japan, Oct. 20, 1969, 44/83240
Int. Cl. H02p 7/28
U.S. Cl. 318—394 **5 Claims**

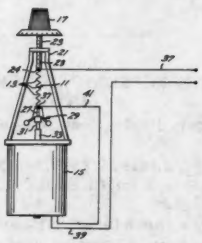


The rotation control circuit comprises a driving circuit performing a switching action to sequentially flow a current to stator windings of a transistor motor and a control switching circuit performing a switching action by a control signal responsive to the rotation speed of a rotor. The control switching circuit acts to perform a current control at the starting time of rotation of the motor and to perform a voltage-current control at the time of constant rotation of the motor.

3,671,838
ELECTRIC MOTOR CONTROL DEVICE

Harold A. McIntosh, South Pasadena, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 805,138, March 7, 1969, Pat. No. 3,577,066. This application March 11, 1971, Ser. No. 123,159
Int. Cl. H02p 3/02
U.S. Cl. 318—471 **10 Claims**



A motor control device for controlling the speed of an electric motor and including electrical resistor means formed with a plurality of portions disposed in heat exchange relationship

with one another and flexible toward and away from one another to adjust the heat exchange rate therebetween, the electrical resistance of the portions being temperature responsive whereby current therethrough is responsive to the temperature thereof. Adjustment means is provided for moving the portions toward and away from one another to adjust the mutual proximity and consequent heat exchange rate therebetween so the electrical current therethrough can be correspondingly adjusted. Electrical circuit means is provided for connecting such resistance means with the motor circuitry.

3,671,839
METHOD AND APPARATUS FOR AUTOMATIC PROGRAMMED CONTROL OF A MACHINE TOOL

Jurgen Meyer, and Gerhard Sautter, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 23, 1970, Ser. No. 74,636

Claims priority, application Germany, Sept. 23, 1969, P 18 03 742.8

Int. Cl. G05b *19/24*

U.S. Cl. 318—571 **5 Claims**

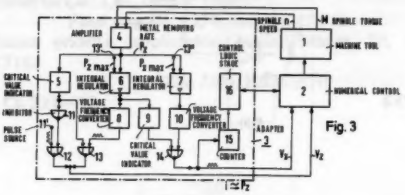


Fig. 3

In a system for programmed control of a machine tool for removal of material from a workpiece, the material removing rate P_z is derived from the speed and torque of the tool or workpiece and the feed velocity V_z is controlled in one direction of movement of the tool or workpiece in dependence upon the material removing rate. A feed velocity V_x is controlled in a direction perpendicular to the one direction in dependence upon the feed velocity V_z and the derivative dP_z/dt.

3,671,840
METHOD AND APPARATUS FOR ADAPTIVE CONTROL OF A TURNING MACHINE

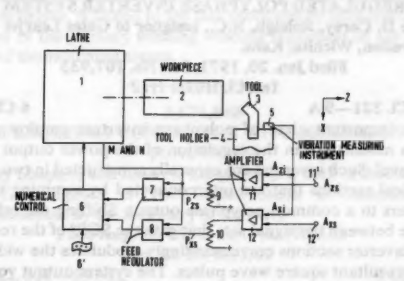
Jurgen Meyer, and Gerhard Sautter, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 23, 1970, Ser. No. 74,637

Claims priority, application Germany, Sept. 23, 1969, P 18 03 742.8

Int. Cl. G05b *19/24*

U.S. Cl. 318—571 **5 Claims**



The vibrations of a tool or workpiece are measured during operation to produce vibration signals corresponding to actual vibrations in mutually perpendicular directions. The vibration signals are compared with signals corresponding to datum magnitudes of vibrations in both directions. The work feeding of the tool or workpiece is corrected in accordance with the comparison results.

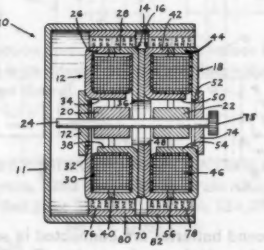
3,671,841
STEPPER MOTOR WITH STATOR BIASING MAGNETS

Gotfred O. Hoffmann, Cheshire, Conn., assignor to Tri-Tech, Inc., Waterbury, Conn.

Filed May 1, 1970, Ser. No. 33,815

Int. Cl. H02k *37/00*

U.S. Cl. 318—696 **17 Claims**



A stepper motor having a pair of field coils, a pair of permanent magnet rotors carried by a single shaft such that their magnetic polarities are displaced ninety mechanical degrees from each other, and two pairs of stator pole pieces. Each pair of stator pole pieces is associated with a separate rotor and a separate field coil. A stationary permanent magnet is mounted on each pair of stator pole pieces, and the magnet generates a bias flux in opposition to the flux of the field coil associated with that pair of pole pieces. When electrical pulses of predetermined polarities are applied selectively to the field coils, there is produced a pre-determined angular advance of the rotor shaft.

3,671,842
BATTERY POWERED EXPLOSIVE SYSTEM WITH RELAXATION OSCILLATION IN CHARGING CIRCUIT

James E. McKeown, Sidney, N.Y., assignor to The Bendix Corporation

Filed March 22, 1971, Ser. No. 126,768

Int. Cl. H03k *3/26*; H02m *3/24*

U.S. Cl. 320—1 **10 Claims**

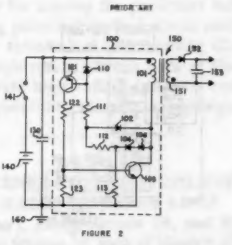


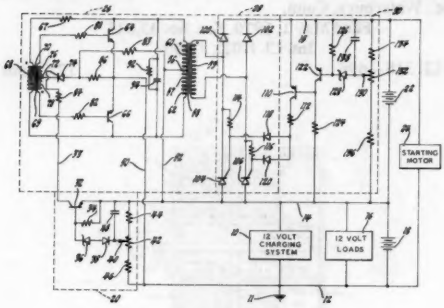
FIGURE 2

An electrical system for firing an explosive bridge wire device or the like which utilizes a battery powered blocking oscillator and a transformer having its primary winding in the oscillator circuit and its secondary winding in the charging circuit of a capacitor.

3,671,843
DUAL VOLTAGE CHARGING SYSTEM

Gerald O. Huntzinger, Anderson, and Leonard J. Sheldrake, Noblesville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 5, 1971, Ser. No. 140,342
Int. Cl. H02j 7/00, 7/14
U.S. Cl. 320—15 5 Claims

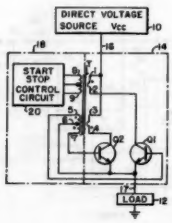


First and second batteries are connected in series between the terminals of a vehicle starting motor. The DC output terminals of a DC generator are connected across the first battery and also across a voltage sensitive switch and the oscillator transformer input stage of a DC to DC converter. The rectifier output stage of the DC to DC converter is combined with a voltage regulator that is connected across a second battery. The voltage sensitive switch renders the input stage of the converter operative when the output of the the generator is greater than a first predetermined voltage and inoperative below. The voltage regulator maintains a second predetermined voltage across the second battery by rendering the output stage of the converter operative to charge the second battery when the voltage thereon is below the second voltage and inoperative above.

3,671,844
DC POWER CONTROLLER WITH STATIC SWITCHING ELEMENTS AND COMMON CURRENT FEEDBACK TRANSFORMER BETWEEN DIRECT VOLTAGE SOURCE AND LOAD

Donal E. Baker, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1970, Ser. No. 92,348
Int. Cl. H02m 3/32
U.S. Cl. 321—2 5 Claims

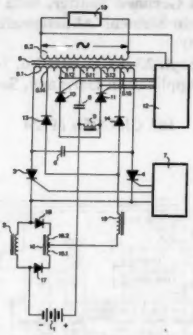


Apparatus to control the application of DC power from a source to a load with static (transistor) switching elements driven by a highly efficient drive circuit. A common current feedback transformer is used to drive the switch from the DC load current. This provides base drive current that is proportional to the DC load current and is insensitive to supply voltage variations.

3,671,845
STABILIZED SINE WAVE INVERTER

Walter Bernhard Guggi, Im Boden 265, CH-8172, Niederglatt, Switzerland

Filed July 19, 1971, Ser. No. 163,801
Claims priority, application Switzerland, July 23, 1970, 11309/70
Int. Cl. H02m 1/08
U.S. Cl. 321—20 6 Claims



A stabilized inverter transforms direct current into sine-like alternating current by means of SCR current valves operating in conjunction with a tuned LC circuit. Chopped direct current, with alternating polarities, is applied across the primary winding of a transformer which has a commutating capacitor connected in parallel therewith. One terminal of a source of DC potential is connected to the center tap of the primary winding in series with a capacitor serving to separate alternating current and direct current. This source terminal is further connected, through an inductor, in parallel to the anodes of two SCR valves whose cathodes are connected to respective taps spaced symmetrically to either side of the center tap of the transformer primary winding. These two SCR valves are triggered by a phase control circuit connected to the transformer output to apply, to the capacitor connected in series with the DC source, either a positive or a negative charge, of variable magnitude, depending on the setting of the phase control circuit. This capacitor charge is either added to or subtracted from the direct current input voltage in accordance with the status of the latter.

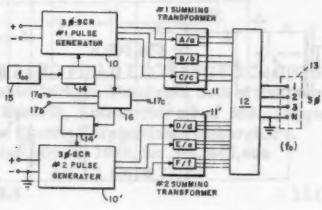
3,671,846
REGULATED POLYPHASE INVERTER SYSTEM

Philip D. Corey, Raleigh, N.C., assignor to Gates Learjet Corporation, Wichita, Kans.

Filed Jan. 20, 1971, Ser. No. 107,933
Int. Cl. H02m 1/12
U.S. Cl. 321—9 A 6 Claims

An important class of polyphase inverters employ pulse width modulation in the regulation of the power output voltage level. Such inverters are generally constructed in two symmetrical sections that are interconnected by summing transformers to a common polyphase output. Shifting the relative phase between the signal sets that gate the SCR's of the respective inverter sections correspondingly modulates the width of their resultant square wave pulses. The system output voltage level is correspondingly controlled. The secondary windings of the summing transformers of the present invention are uniquely arranged and interconnected to substantially reduce the

size, weight and cost of the output transformer array. Further, a four-wire three-phase inverter system is directly provided without an auxiliary transformer that was heretofor required therefor.



3,671,847
POWER SUPPLY FOR DRIVING MAGNETRON

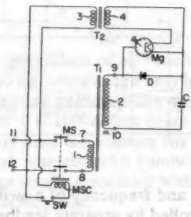
Takashi Shibano, Suita, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 28, 1970, Ser. No. 67,961

Claims priority, application Japan, March 20, 1970, 44/27165

Int. Cl. H02m 7/06; H03b 9/10

U.S. Cl. 321—32 **6 Claims**



A compact power supply for driving a magnetron to oscillation used for an electronic cooking range. A transformer having a three-legged magnetic core with at least primary, secondary and tertiary windings. The primary winding is divided into two halves, each wound on a separate leg of the core and switching means are provided for changing the direction of the magnetic flux produced by one half of the winding with respect to the other half. The secondary winding is linked by the flux from each half of the primary winding and is arranged to selectively provide the magnetron with high voltage in accordance with the position of the switching means. The tertiary winding, which is arranged to provide voltage to the magnetron heater, is linked to the flux produced by only one of the halves of the primary winding winding regardless of the position of the switching means.

3,671,848
FREQUENCY CONVERSION WITH JOSEPHSON JUNCTIONS

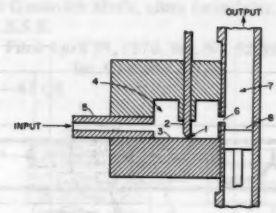
Sidney Shapiro, and Andrew Longacre, Jr., both of Rochester, N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 27, 1971, Ser. No. 175,533

Int. Cl. H02m 5/00

U.S. Cl. 321—69 NL **4 Claims**

Josephson junctions are utilized to accomplish frequency conversion—either down conversion or up conversion. The junction is coupled to a resonant cavity and simultaneously irradiated by an external source at frequency f, which differs from the resonant frequency of the cavity f_c. In order for an output to be produced at this frequency, f_c, the voltage bias across the junction must be at one of the values $V=h\ (f_c \pm nf)$]2e, where n is an integer and the absolute value is used since nf may be larger than f_c.



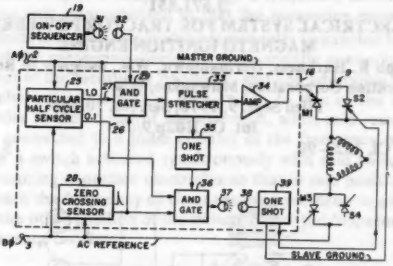
3,671,849
THREE-PHASE POWER CONTROLLER

Floyd E. Kingston, 2282 Columbia St., Palo Alto, Calif.

Filed June 21, 1971, Ser. No. 154,898

Int. Cl. G05f 1/40

U.S. Cl. 323—24 **10 Claims**



A three-phase power controller for controlling three-phase power to a non-unity power factor load is disclosed, which employes a separate bidirectional gate in series with each of the lines to the three-phase load for gating the load current to the load. Each bidirectional gate includes a master gate and a slave gate slaved to the master gate. A synchronous control circuit supplies a sequence of gating on signals to the respective gates. The synchronous control circuit includes a zero-crossing sensor for sensing the alternating potential supplied across each set of power supply terminals and a particular half-cycle sensor for sensing the particular half-cycle of each of the alternating potential applied across each respective set of power supply terminals. Light emitting diodes and photo detectors are employed in various ones of the gating control channels to provide high voltage isolation between the gates and the circuits generating the gate control signals.

3,671,850
ELECTRIC GENERATOR CONTROL SYSTEM WITH RADIO FEEDBACK LOOP

Walter E. Mehnert, Elvira-Strasse 29, and Horst A. Heller, Pfarrer-Grimm Strasse 24, both of Munich, Germany

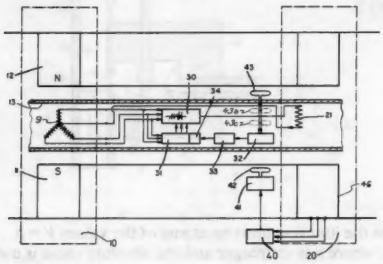
Continuation-in-part of Ser. No. 724,478, April 26, 1968. This application Nov. 19, 1970, Ser. No. 91,196

Int. Cl. H02p 9/30

U.S. Cl. 322—28 **3 Claims**

The illustrated embodiments include an exciting generator and a power generator. Each of the generators includes a common tubular rotor. The armature of the exciting generator is

maintained within the rotor and is fed through a control rectifier to the field of the power generator, which is also maintained within the rotor. The output voltage of the power generator is sampled for modulation of a radio transmitter which delivers power to a transmitting antenna. A receiving



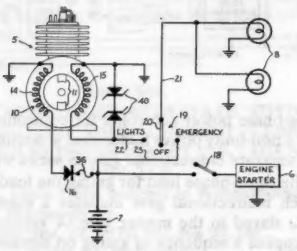
means maintained within the tubular rotor receives and demodulates the signal from the transmitter. The demodulated signal, together with the output of the field generator armature is applied to the control elements of the control rectifier and thus determines the intensity of the power generator field and, correspondingly, the output of the power generator.

3,671,851

ELECTRICAL SYSTEM FOR TRACTOR POWERED BY MAGNETO IGNITION ENGINE

Joseph R. Harkness, Germantown, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis.

Filed Sept. 9, 1970, Ser. No. 70,669
Int. Cl. H02p 9/00
U.S. Cl. 322—90 **5 Claims**



An alternator driven by a magneto ignition engine has separate windings for battery charging and for lights. The battery charging winding is at all times connected with a storage battery through rectifier means and is designed for a maximum engine rpm output that will not harm the battery even when it is fully charged. The lights are normally energized only from the light winding, but switch arrangements are disclosed for energizing the lights from the battery when the engine is not running.

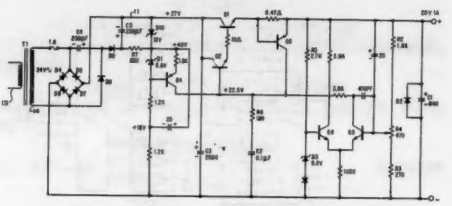
3,671,852

SERIES TRANSISTOR POWER SUPPLY REGULATOR

Jean Ritzenthaler, Geneva, Switzerland, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 1, 1971, Ser. No. 176,957
Int. Cl. G05f 1/64; H02m 7/24
U.S. Cl. 323—9 **4 Claims**

A power supply regulator of the series transistor type employing a current limiter transistor circuit coupled to the output of the series transistor and a constant current supply comprising a transistor and Zener diode for supplying current to the current limiter transistor circuit, and a voltage multiplier



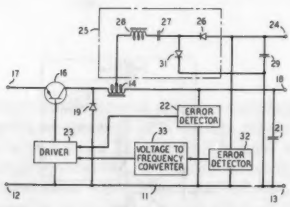
circuit coupled to the rectifier circuit input of the regulator circuit, said constant current supply being coupled to said voltage multiplier circuit.

3,671,853

DUAL-OUTPUT REGULATED SWITCHING POWER SUPPLY

Herbert Rudolf Weischedel, Rockaway, and George Raymond Westerman, Denville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 24, 1970, Ser. No. 101,318
Int. Cl. G05f 1/56
U.S. Cl. 323—17 **7 Claims**



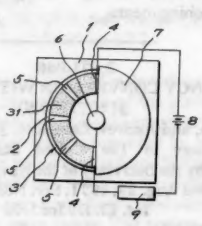
The duty cycle and frequency of a switching transistor are individually controlled by separate feedback loop to give two independently regulated output voltages. The main output is controlled by the duty cycle feedback loop in a conventional manner. The auxiliary output is fed by a frequency-to-voltage converter and has a voltage-to-frequency converter in its feedback loop.

3,671,854

CONTACTLESS GALVANO-MAGNETRO EFFECT APPARATUS

Noboru Masuda, Kawaguchi, Japan, assignor to Denki Onkyo Co., Ltd.

Filed Nov. 30, 1970, Ser. No. 93,636
Int. Cl. G05f 7/00
U.S. Cl. 323—94 H **12 Claims**



A contactless galvano-magnetro effect apparatus comprised of a magneto resistance effect device which is provided with a

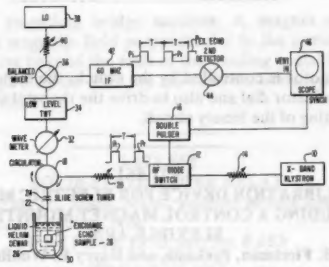
plurality of electrodes, between which a plurality of resistance yokes are provided, at least one of the yokes being associated with a magnetic field applying means which is capable of varying the condition of magnetic field applied to the resistance yoke.

3,671,855

BROADBAND ZERO FIELD EXCHANGE ECHO SYSTEM

Donald A. Bozanic; Dickron Mergerian, both of Baltimore, and Ronald W. Minarik, Lutherville, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 28, 1969, Ser. No. 845,406
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 12 Claims



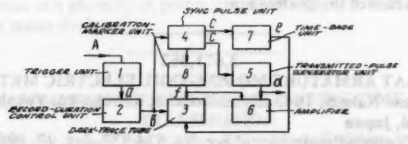
A system for the generation of an "exchange echo" signal similar to a spin echo signal utilizing a very heavily doped sample such as rutile, having paramagnetic defect centers in the order of 1×10^{19} to 1×10^{21} defect centers/cm, wherein no magnetic field of any kind is necessary for the production of the echo signals, and wherein echo bandwidths considerably greater than those generally associated with spin echoes (less than 300 MHz) are achievable.

3,671,856

PULSE REFLECTION TYPE FAULT LOCATION DEVICE UTILIZING A DARK-TRACE TUBE DISPLAY

German Mikhailovich Shalyt, prospekt Vernadskogo, 83, kv. 45; Svetlana Efimovna Sidorchuk, ulitsa Festivalnaya, 22, korpus 3, kv. 287, and Gely Georgievich Pavlov, Moskvorechie, 84, kv. 30, all of Moscow, U.S.S.R.

Filed Sept. 16, 1969, Ser. No. 858,430
Int. Cl. G01r 31/11
U.S. Cl. 324—52 1 Claim



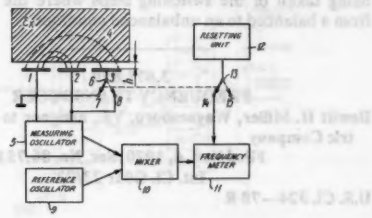
A device for the location of faults on power-transmission lines at the instant of a fault, in which transmitted and reflected pulses are registered in synchronism with calibration markers by a dark-trace tube, which fact considerably increases the speed of response of the recorder.

3,671,857

DEVICE FOR MEASURING PERMITTIVITY OF MATERIALS

Karlis Alfredovich Bergmanis, ulitsa Graudu, 15, kv. 1; Erik Ernestovich Klotinsh, ulitsa Tvaika, 54, korpus 4, kv. 19, and Imant Gustovich Matis, ulitsa Laimdotas, 61, kv. 19, all of Riga, U.S.S.R.

Filed April 29, 1970, Ser. No. 32,823
Int. Cl. G01r 27/26
U.S. Cl. 324—61 QS 1 Claim



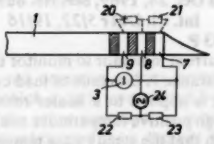
A device for measuring permittivity of materials on the basis of at least two different capacitance values of a measuring capacitor connected to the material being tested and to a measuring oscillator the output of which is coupled to one input of a mixer whose other input is coupled to a reference oscillator and whose output is coupled through a frequency meter to a resetting unit, characterized in that the measuring capacitor has at least two main electrodes permanently connected to the input of the measuring electrodes permanently connected to the input of the measuring oscillator, and one additional electrode alternately connected by a switch to one of the main electrodes in the course of measurement, while said resetting unit is connected to a pulse counter of the frequency meter through a switch actuated synchronously with said switch of the measuring capacitor electrodes so that in one position of this switch the frequency of the measuring oscillator is above, and in the other position of the switch, below the frequency of the reference oscillator.

3,671,858

METHOD AND APPARATUS FOR MEASURING THE THICKNESS OF LAYERS OF FAT AND FLESH IN CARCASSES UTILIZING THE DIFFERENCE IN ELECTRICAL CONDUCTIVITY BETWEEN LAYERS

Erik Stenberg Knudsen, Roskilde; Svend Erik Iversen, Ballerup; Svend Aage Lund, Birkerod, and Allan Northeved, Barsvaeerd, all of Denmark, assignors to Slagteriernes Forsknungsinstitut, Roskilde, Denmark

Filed Feb. 17, 1971, Ser. No. 115,963
Claims priority, application Denmark, Feb. 20, 1970, 853
Int. Cl. G01r 27/02
U.S. Cl. 324—65 24 Claims



A method and an apparatus for measuring the thickness of layers of fat and flesh in carcasses utilizing the difference in electrical conductivity between said layers. A probe with three surface electrodes is introduced in to the carcass said electrodes being connected to an AC bridge for connecting adjacent current paths formed in the layers between said elec-

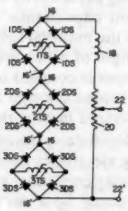
trodes thereto. The probe is moved on, until an unbalanced condition of the bridge is observed by indicator means. The linear distance between measuring points associated with the carcass surface and the probe, respectively, being, then, measured in order to obtain the thickness of the fat layer. The probe may be moved right through the carcass in order to determine total thickness thereof by detecting flesh to air transition and retracted again for repeating the measurement made during insertion. Alternatively, a probe provided with a plurality of surface electrodes may be inserted in a stationary position in the carcass, said electrodes being then connected successively to the bridge by switching means and recordings being taken of the switching steps where the bridge enters from a balanced to an unbalanced condition.

3,671,859

FREQUENCY TRANSDUCER

Dewitt H. Miller, Waynesboro, Va., assignor to General Electric Company

Filed Nov. 4, 1970, Ser. No. 86,751
Int. Cl. G01r 23/02
U.S. Cl. 324—78 R **5 Claims**



A novel frequency transducer is disclosed, the transducer providing a uni-directional average signal output which is proportional to the frequency of an applied three-phase generally sinusoidal input signal. In a preferred inventive embodiment, the transducer comprises a three-phase transformer having primary, secondary and tertiary windings on a saturable core with voltage clipping means including the tertiary windings of the transformer. Rectification and summation means are also provided for summing and rectifying the outputs of the secondary windings of said transformer, those outputs being averaged by averaging means. The frequency transducer output is essentially independent of the voltage of the input signal.

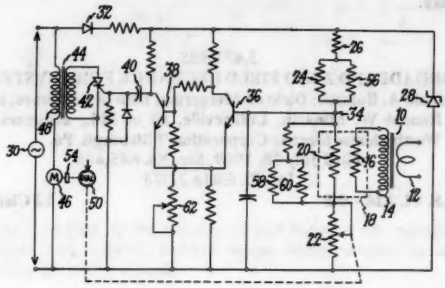
3,671,860

MAXIMUM CURRENT INDICATOR FOR ELECTRICAL APPARATUS

Clarence J. Kettler, and Clifford L. Downs, both of Lenox, Mass., assignors to General Electric Company

Filed Oct. 24, 1969, Ser. No. 869,067
Int. Cl. G01r 5/22, 19/16
U.S. Cl. 324—103 P **5 Claims**

A maximum current indicator to monitor the current flow in an electrical apparatus. A facsimile of load current from a current transformer is applied to a heater resistor. A sensor resistor having a high positive temperature coefficient is coupled to the heater such that the steady state temperature of the sensor is directly proportional to the power dissipated in the heater, making such temperature a function of the facsimile load current. The sensor resistor is part of a voltage divider network which includes a rheostat, the voltage across such divider being determined by a Zener diode. The divider output voltage at a junction thereof is determined by the sensor resistor and the rheostat. A pair of transistors are arranged in an emitter coupled binary circuit whose conduction states are determined by the voltage at the junction of the divider network. An isolation transformer and a silicon controlled rectifier form a switching circuit which is actuated by the binary circuit. A motor is controlled by the switch, the motor acting to set an indicator dial and also to drive the rheostat to a position for resetting of the binary circuit.

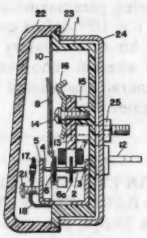


3,671,861

CALIBRATION DEVICE FOR ELECTRIC METER INCLUDING A CONTROL MAGNET MOUNTED ON A FLEXIBLE ARM

Hobart H. Fleetman, Perkasie, and Harry E. Wohlbach, Allentown, both of Pa., assignors to Electro-Mechanical Instrument Company, Inc.

Filed April 8, 1965, Ser. No. 446,745
Int. Cl. G01r 5/16, 1/20
U.S. Cl. 324—146 **7 Claims**



An electrical meter having a movement magnet and a control magnet for zeroing the meter pointer and also adjusting the meter sensitivity. The control magnet is pivotally mounted for rotation on a flexible arm. Zeroing of the meter is obtained by rotating the control magnet relative to the movement magnet. The sensitivity of the meter is adjusted by varying the distance between the movement magnet and control magnet by means of the flexible arm.

3,671,862

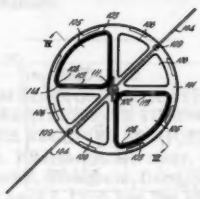
FLAT ARMATURE MOVING COIL ELECTRIC METER

Toyozo Nakata, 1643 Hiyoshihoncho, Kohoku-ku, Yokohama-shi, Japan

Continuation-in-part of Ser. No. 534,937, Jan. 27, 1966, abandoned. This application Dec. 9, 1969, Ser. No. 883,533
Claims priority, application Japan, Feb. 5, 1965, 40/7898
Int. Cl. G01r 1/20, 1/16
U.S. Cl. 324—150 **5 Claims**

An electrical meter includes a rotatably mounted wheel shaped armature including a channel shaped rim and channel shaped spokes arranged in quadrature. A pair of sector shaped coils of insulator coated wire are nested in seats delineated by

pairs of adjacent spokes and the connecting rim section, each coil including a plurality of superimposed flat sector shaped windings of abutting successive convolutions including radially extending legs whose outer ends are connected by circumferentially extending bridge sections. A magnet assembly produces a magnetic field perpendicular to the armature and not extending beyond the ends of the winding radial legs. The areas occupied by the coils are less than the unoccupied areas delineated thereby.

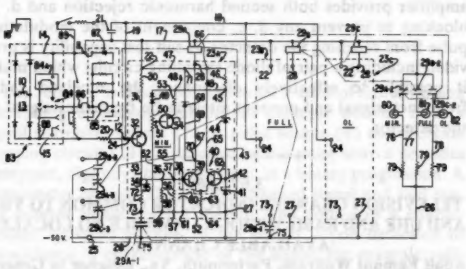


3,671,863

SOLID STATE METER RELAY

Earl C. Rhyne, Jr., Millis, Mass., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Feb. 4, 1970, Ser. No. 8,653
Int. Cl. G01r *1/30*
U.S. Cl. 324—157 **6 Claims**



A meter relay in which the mechanical contacts on the meter of a mechanically operating type of relay are replaced by solid state circuitry. The circuitry is readily adjustable by a simple potentiometer of rheostat to operate an indicating signal and/or a control for industrial apparatus or the like at any desired point over the entire range of a meter. The circuitry is operative, however with or without a meter. A plurality of identical circuits mounted on separate panels or modular units may be ganged to operate different indicators and/or controls at a plurality of points over the range of one or more relay meter devices.

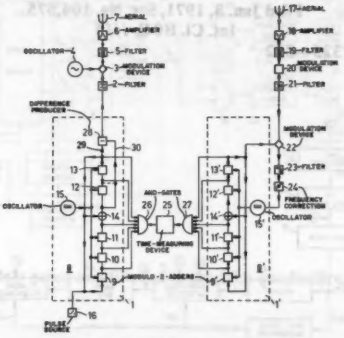
3,671,864

TRANSMISSION SYSTEM FOR MEASURING TIME OF TRANSMISSION

Leo Eduard Zegers, and Wilfred Andre Maria Snijders, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 17, 1970, Ser. No. 47,001
Claims priority, application Netherlands, June 21, 1969, 6909540
Int. Cl. H04b *1/00*
U.S. Cl. 325—38 A **4 Claims**

A transmission system wherein a periodic ternary pulse pattern is generated in the transmitter which pattern is transmitted after modulation on a carrier, for example, single sideband modulation, and which is correlated after demodulation with a periodic binary pulse pattern after reception in the receiver.

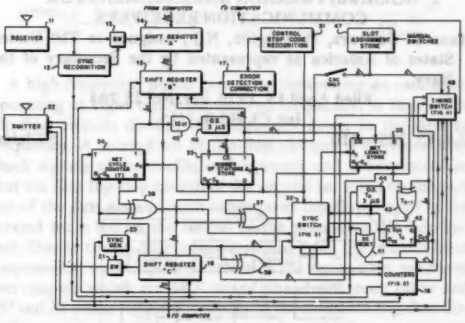


3,671,865

AUTOMATIC NET PARTICIPANT SYNCHRONIZER

Anthony D. Szumila, Levittown; Joseph J. Zimnoch, Trevose; John D. Bechtel, Hatboro, and Harvey M. Steinberg, Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 3, 1964, Ser. No. 415,827
Int. Cl. G08c *15/06*; H04j *3/06*
U.S. Cl. 325—58 **9 Claims**

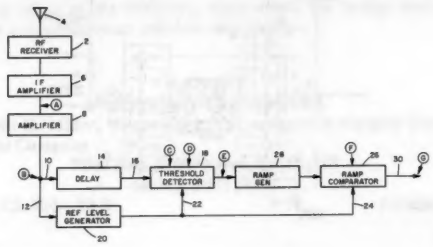


A digital data net communications system for a group of tactical units in which data is transmitted by each participant in turn to all of the other participants, in which participants may be added or subtracted from the net automatically and without interfering with the transmission of data between the others. One of the participants is designated the contact area commander and during his time slot automatically synchronizes the other participants' equipment, informs the other participants of the number of participants in the net, and any changes in the number of participants in the net thereby informing all participants of the net condition without the necessity of disrupting the transmission of data between other participants.

3,671,866
PULSE PROCESSING CIRCUIT HAVING IMPROVED RANGE RESOLUTION

Kenneth R. Rutherford; Marvin L. Hooker, Jr., both of Cedar Rapids, Iowa, and Joseph P. Alibrandi, Raleigh, N.C., assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed Jan. 8, 1971, Ser. No. 104,875
Int. Cl. H04b 1/16
U.S. Cl. 325—322 3 Claims

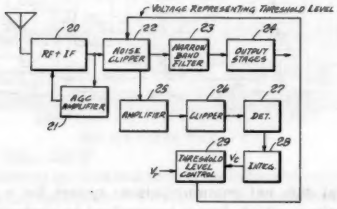


A pulse processing circuitry which substantially eliminates pulse position variations caused by compression of pulses in IF stages of video receivers as a result of conflicting requirements for narrow bandwidth and large dynamic range. The variations are eliminated while retaining the pulse width characteristics of a pulse train by splitting the input pulse into two signal channels, delaying the pulse in one channel for a predetermined interval, applying the delayed pulse to trigger a ramp generator, and comparing the resulting ramp signal with a reference level signal produced by the pulse in the second channel.

3,671,867
NOISE SUPPRESSION ARRANGEMENT FOR COMMUNICATION RECEIVERS

Hans G. Schwarz, Pennington, N.J., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 15, 1970, Ser. No. 28,704
Int. Cl. H04b 1/16
U.S. Cl. 325—410 5 Claims

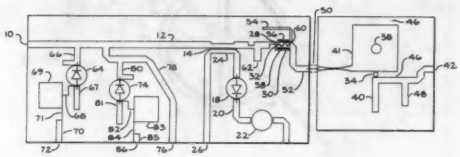


A noise suppression technique for a communication receiver is disclosed wherein the amplitude of the signal at the clipping point with respect to the clipping level, or vice versa, is automatically adjusted so that clipping takes place during a constant preset percentage of time. The gain of the RF or IF stages or the clipping level is automatically adjusted to achieve this mode of operation.

3,671,868
SUPERREGENERATIVE MICROWAVE RECEIVER

Bobby J. Sanders, Pacoima, Calif., assignor to The Bendix Corporation

Filed Jan. 21, 1970, Ser. No. 4,641
Int. Cl. H04b 1/26
U.S. Cl. 325—445 8 Claims

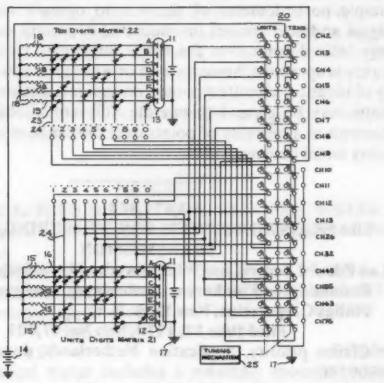


A highly sensitive superregenerative microwave receiver is disclosed having a special utility for radar altimeters. A tunnel diode oscillator-amplifier section is arranged on a stripline board one wavelength square with the housing forming the ground plane and with the tunnel diode centered on the board. A threaded member in the top of the housing cooperates with a conductor track on the stripline board to tune the oscillator resonant circuit. A detector and self-test stripline board is positioned in another compartment of the housing separated from the oscillator-amplifier board by means of a bulkhead but connected to said board by means of a feed-through connector. This board contains the radio frequency input port and includes a stripline coupler arrangement to connect the radio frequency signal to the detector diode. A stripline filter connected between the radio frequency input and the oscillator-amplifier provides both second harmonic rejection and d. c. blocking to prevent any d. c. component of the modulating pulse from reaching the detector. A self-test capability is provided including a pair of diode switching circuits which make it possible to effectively disconnect the received radio frequency signal and connect a test radio frequency signal to the detector.

3,671,869
TELEVISION CHANNEL INDICATOR COMMON TO VHF AND UHF AND EASILY PROGRAMMABLE TO LOCALLY AVAILABLE CHANNELS

Adolf Egmont Wolfram, Portsmouth, Va., assignor to General Electric Company

Filed Feb. 16, 1971, Ser. No. 115,623
Int. Cl. H04b 1/06
U.S. Cl. 325—455 14 Claims



A channel indicator for a television receiver for indicating tuning to all channels whether UHF or VHF. Two segmented

decimal display devices are provided, one for the units digits and one for the tens digits of channels two to 83. Matrices control each display device. Switches assigned to each channel and associated with a conventional tuning mechanism control the matrices to cause the display devices to display the channel number of the channel to which the receiver is tuned by the tuning mechanism.

3,671,870

TUNING SYSTEM FOR COMMUNICATION RECEIVERS STORING PREDETERMINED TUNING POSITIONS WITHIN THE RECEIVER FREQUENCY BAND

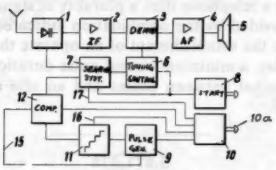
Heinz Wellhausen, Hildesheim, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed April 1, 1970, Ser. No. 24,513

Claims priority, application Germany, April 2, 1969, P 19 16 834.4

Int. Cl. H04b *1/34*

U.S. Cl. 325—470 **18 Claims**



The receiver is designed to provide a control signal varying the tuning frequency thereof, for example derived from a signal searching system (7). A pulse source (9) and a digital stepping circuit (11), controlled by the pulse source provides a stepped, digitally changing signal, in a binary progression. A comparator circuit (12) has said stepped signal and said tuning control signal applied thereto, and compares a characteristic, typically voltage, of the signals. Upon detection of coincidence, a characteristic of the signal, for example voltage, is stored, for example as a level of magnetization in a transfluxor core (FIG. 4) or as the count of a flip-flop chain, including magnetic cores, in the digital stepping circuit. Upon re-energization of the receiver after disconnection, a voltage value derived from the digital stepping circuit, or from the storing means can be directly applied to the tuning control, or the signal search system, respectively, so that the receiver will be pre-tuned to the selected frequency.

3,671,871

SIGNAL FREQUENCY SYNTHESIZER

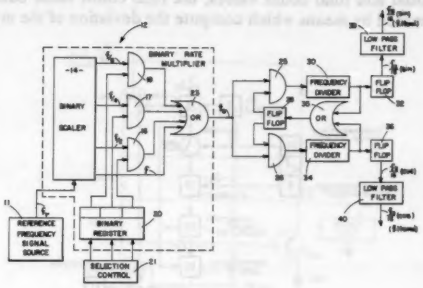
Robert E. Maim, Los Angeles, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Dec. 14, 1970, Ser. No. 97,576

Int. Cl. H03b *19/00*

U.S. Cl. 328—25 **4 Claims**

A plurality of binary related anti-coincident pulse trains which are precisely related in frequency and phase to a reference frequency are generated in a binary rate multiplier. The rate multiplier includes gating and control circuitry whereby predetermined combinations of these pulse trains are selectively summed together to provide various output frequencies. The output of the binary rate multiplier, which comprises square wave signals having a predetermined frequency relative to the reference signal frequency, are divided to minimize the effects of irregularities in the frequency of the multiplier output and to provide square waves having substantially uniform periods. These square waves are then



appropriately gated and filtered to produce quadrature related sine waves.

3,671,872

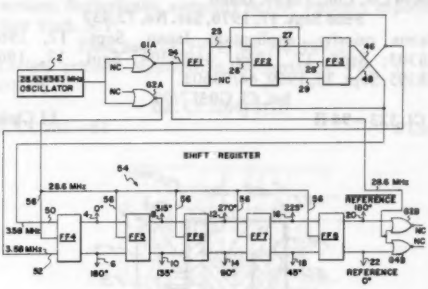
HIGH FREQUENCY MULTIPLE PHASE SIGNAL GENERATOR

Donald E. Pauly, Salt Lake City, Utah, assignor to Telemation, Inc., Salt Lake City, Utah

Filed March 26, 1971, Ser. No. 128,838

Int. Cl. H03b *3/04*

U.S. Cl. 328—55 **5 Claims**



A high frequency phase generator comprising an oscillator, operating at eight times the desired frequency. A first set of flip-flop circuits divides the frequency down to the desired frequency. A second set of flip-flop circuits is provided with clock signals at the oscillator frequency and is connected so that the first flip-flop circuit of the second set is fed by the output of the first set and each subsequent flip-flop circuit in the second set is fed by the output of the preceding flip-flop circuit. Due to timing differences resulting from the two different frequencies, each flip-flop circuit in the second set produces two outputs which are 180° out of phase with each other and 45° out of phase with the outputs of the adjacent flip-flop circuits.

3,671,873

CIRCUIT ARRANGEMENT FOR GENERATION TIMING PULSES

Guenther Haas, and Dieter Reinhardt, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 15, 1971, Ser. No. 124,124

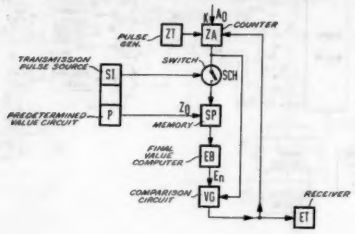
Claims priority, application Germany, March 23, 1970, P 20 13 880.1

Int. Cl. H03k *1/00, 5/00*

U.S. Cl. 328—63 **12 Claims**

A circuit arrangement for generating timing pulses for a receiver system constantly synchronized with transmission im-

pulses of a transmitter system wherein a counter is operated by pulse generator and delivers to a memory the pulse count upon receipt of a transmission pulse. The counter has adjustable initial and final count values, the final count value being determined by means which compute the deviation of the mo-



mentary value from a predetermined count value and a comparison circuit for generating the receiver timing pulse and utilizing the same to reset the counter. An initial value computer is also utilized in one embodiment for adjusting the initial count value of the counter in accordance with the output of the memory.

3,671,874

CONTACTLESS ROTARY SWITCHING APPARATUS

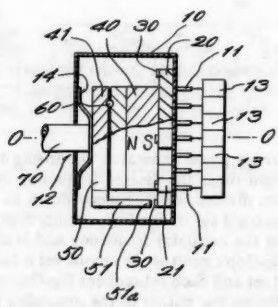
Tunekazu Kobayashi, Kawasaki, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Sept. 17, 1970, Ser. No. 72,937

Claims priority, application Japan, Sept. 17, 1969, 44/88303; Sept. 17, 1969, 44/88304; Sept. 17, 1969, 44/88305; Sept. 30, 1969, 44/93603

Int. Cl. G05f 7/00

U.S. Cl. 323—94 H 11 Claims



A contactless rotary switching apparatus comprised of a disc-shaped fixed yoke which is stationary and a rotary yoke arranged in parallel with each other, a magnet positioned between the yokes, the magnet having one magnetic pole end fixed to one of the yokes while the other magnetic pole end is made free but arranged to lightly contact the other of the yokes, a number of balls made of magnetic material are arranged in succession in the form of a circle on the free end face of the magnet between the magnet and the yoke which lightly contacts the free end of the magnet, a plurality of magneto-electric converting devices are arranged radially towards the circumference at the peripheral portion of the fixed yoke, and at least one arm provided at the peripheral portion of the rotary yoke so that the arm or arms are extended towards the said fixed yoke so that an end or ends of the arms will be moved towards and away from the magneto-electric converting devices during rotation of the rotary yoke.

3,671,875

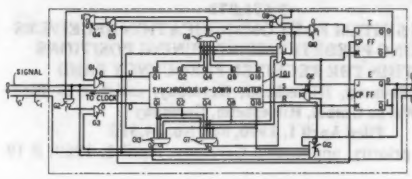
DIGITALLY OPERATED SIGNAL REGENERATOR AND TIMING CIRCUIT

Frank Louis Pento, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 20, 1971, Ser. No. 145,290

Int. Cl. H03k 17/26

U.S. Cl. 328—129 5 Claims



A digitally operated signal timing circuit employs a single synchronous up-down counter with overriding set and reset in combination with a group of flip-flops and logic gates. In effecting the regeneration of input pulses, such as the pulses produced by a telephone dial, a plurality of signal timing functions are provided by the combination indicated, which functions include the establishment of an operate threshold delay, a release delay, a minimum output pulse duration, a minimum duration interval between pulses and an idle condition holdover period.

3,671,876

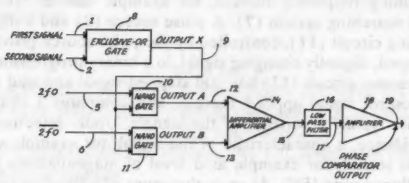
PULSE-PHASE COMPARATORS

George S. Oshiro, P.O. Box 90876, Los Angeles, Calif.

Filed Jan. 19, 1971, Ser. No. 107,724

Int. Cl. H03d 13/00

U.S. Cl. 328—134 8 Claims



The device disclosed herein is a pulse-phase comparator of a digital nature possessing a high degree of noise immunity due to the complete absence of triggerable elements such as binaries or one-shoe multivibrators, and featuring a mode of operation wherein a null output is defined by a corresponding in-phase condition of the compared input signals by virtue of the insertion of additional and externally-generated pulse signals whose fundamental-frequency and phasing character bears a fixed relationship to that of one of the compared signals.

3,671,877

PUSH-PULL AMPLIFIER

Rudy Johan Van Den Plassche, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1970, Ser. No. 79,408

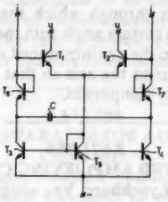
Claims priority, application Netherlands, Oct. 13, 1969, 6915478

Int. Cl. H03f 3/68

U.S. Cl. 330—30 D 2 Claims

A low-resistance push-pull amplifier in which the inclusion of a diode in the emitter lead and of transistors in the base

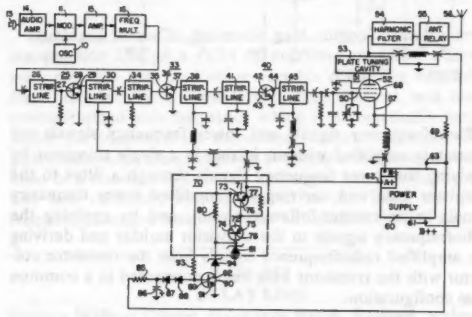
leads of the amplifier provides a very high discrimination factor, while additional current sources for the quiescent current adjustment of the transistors may be dispensed with.



3,671,878
PROTECTION CIRCUIT FOR AN AMPLIFIER

John E. Becker, Wilmette, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed April 27, 1970, Ser. No. 32,204
Int. Cl. H03f 21/00, 5/00
U.S. Cl. 330—207 P **9 Claims**



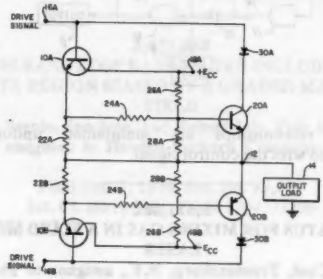
A protection circuit for a driver amplifier is provided which senses the absence of current to a driven amplifier and decreases the voltage supplied to the driver amplifier to a safe value thereby preventing damage to the same. The driver amplifier may be a semiconductor (transistor) amplifier and the driven amplifier may be a vacuum tube amplifier which has a warm up period much longer than that of the semiconductor amplifier. The protection circuit protects the semiconductor amplifier during warm up of the tube amplifier, or in the event of failure thereof by reducing the operating voltage applied thereto.

3,671,879
TRANSISTOR PROTECTION CIRCUIT

John J. Klanatsky, New York, N.Y., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 9, 1970, Ser. No. 87,923
Int. Cl. H03y 21/00
U.S. Cl. 330—207 P **1 Claim**

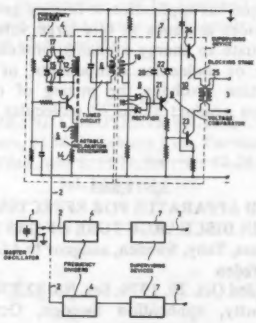
A protection circuit for use with a transistor amplifier comprises a normally non-conductive transistor adapted to be connected across the input and output terminals of the output transistors of a power amplifier. An impedance network is coupled to the power amplifier so that it can derive voltages dependent upon the current flow in the emitter-collector circuit of the power amplifier and the emitter-collector voltage drop. These voltages are applied to the base of the protection transistor to drive it into conduction in the event either one of the signals, or the combination of both exceeds a predetermined limit. Thus, in the event of an overload (due, for example, to excessive load currents or overdriving the transistor), the drive signal is shunted from the power amplifier output stages. This action is analogous to a limiting action and prevents overload conditions from injuring or destroying the power amplifier.



3,671,880
DEVICE FOR GENERATING A PLURALITY OF SINUSOIDAL OSCILLATIONS IN A CARRIER TELEPHONY SYSTEM

Wilhelmus Gerardus Kuiper, and Anne Klaassen, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,216
Claims priority, application Netherlands, Feb. 5, 1970, 7001606
Int. Cl. H04j 3/10
U.S. Cl. 331—51 **6 Claims**



A device for generating carrier oscillation while using astable relaxation generators which are synchronized by a common master oscillator. The astable relaxation generators in the output circuits of the common master oscillator include a supervising device which is constituted by a cascade circuit of a rectifier device, a voltage comparison stage and a blocking stage to suppress the cross-talk between the carrier channels due to erroneously generated frequencies when synchronization is lost.

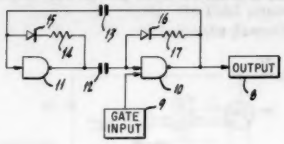
3,671,881
RESETTABLE LOGIC GATE MULTIVIBRATOR

John James Yorganjian, West Palm Beach, Fla., assignor to RCA Corporation

Filed Dec. 14, 1970, Ser. No. 97,797
Int. Cl. H03k 3/282
U.S. Cl. 331—57 **6 Claims**

A multivibrator circuit which can be selectively started and

stopped in response to a control signal and in which phase and



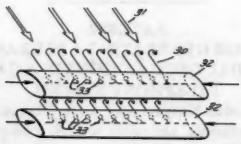
frequency relationships are maintained uniform and synchronized with the control signal.

3,671,882

APPARATUS FOR MIXING GAS IN A FLUID MIXING LASER

Terrill A. Cool, Trumansburg, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 25, 1970, Ser. No. 75,593
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 **2 Claims**



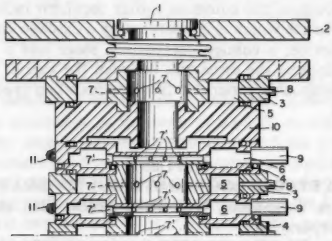
Apparatus is disclosed which can continuously mix indefinitely large volumes of gases in characteristic times that are short compared to characteristic collisional relaxation times for the excitation energy for the component gases. The present technique has application to flowing gas laser systems in that it provides a means to mix large volumes of gases together to initiate an energy exchange process between the mixing atomic or molecular components, or to initiate a chemical reaction involving the mixing of reactant components to form product atoms or molecules in an excited state.

3,671,883

PROCESS AND APPARATUS FOR EFFECTING HIGH GAS FLOW IN DISCHARGE TUBE OF GAS LASER

Erik Algot Smars, Taby, Sweden, assignor to AGA Aktiebolag, Lindingo, Sweden

Filed Oct. 20, 1970, Ser. No. 82,274
Claims priority, application Sweden, Oct. 20, 1969, 14322/69
Int. Cl. H01s 3/04
U.S. Cl. 331—94.5 **6 Claims**



Gas lasers characterized by high gas flow through the discharge tube of the gas lasers are obtained by feeding the gas to the discharge tube radially in a plurality of sections along the discharge tube and preferably removing the gas via outlet sections provided between the gas inlet sections.

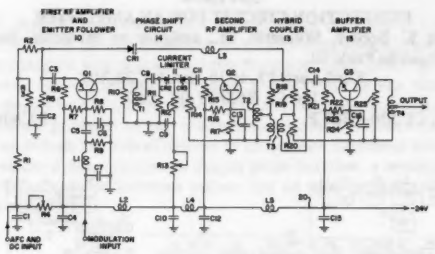
The holes or slots through which the gas is radially introduced may form a certain angle with the radius so as to give a rotary movement to the gas introduced and/or an angle with a plane perpendicular to the axis so that the inflowing gas is given an axial velocity component.

3,671,884

IMPROVED AMPLIFYING CIRCUIT

John H. Denny, Jr., Lynchburg, Va., assignor to General Electric Company

Division of Ser. No. 858,773, Sept. 17, 1969, Pat. No. 3,564,456. This application Sept. 29, 1970, Ser. No. 76,529
Int. Cl. H03f 3/38
U.S. Cl. 332—16 T **2 Claims**



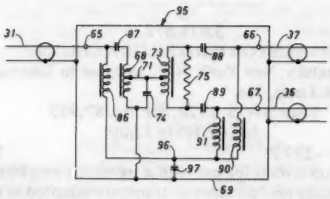
Radiofrequency signals and lower frequency signals are separately amplified without mixing in a single transistor by applying the lower frequency signals through a filter to the transistor base and deriving the amplified lower frequency signals in an emitter-follower circuit, and by applying the radiofrequency signals to the transistor emitter and deriving the amplified radiofrequency signals from the transistor collector with the transistor base being connected in a common base configuration.

3,671,885

HIGH FREQUENCY SIGNAL ROUTING DEVICES FOR USE IN CATV SYSTEMS

Frank C. Pennypacker, Lindsay, Ontario, Canada, assignor to Lindsay Specialty Products Limited, West Lindsay, Ontario, Canada

Filed Dec. 2, 1970, Ser. No. 94,230
Claims priority, application Canada, Oct. 20, 1970, 95,974
Int. Cl. H03h 7/48
U.S. Cl. 333—8 **16 Claims**



Passive devices for signal routing such as directional couplers, hybrid splitters and power inserters, for use in CATV or similar signal distribution systems having improved operating characteristics are obtained by the incorporation of pi-section high-pass filters into such devices. Conventional splitters and directional couplers are modified by the addition of inductances and capacitances so that the required pi-sec-

tion high-pass filters are formed, with one inductive element of such a filter being constituted by an inductive deviation, for example, a leakage inductance of an existing component of such a device. Improved radiofrequency signal return losses and inter-tap isolation are provided over a much greater frequency range than was heretofore possible.

3,671,886

METHOD AND APPARATUS FOR AUTOMATIC GAIN CONTROL

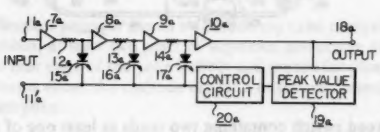
Isao Fudemoto, Tokyo; Tsutomu Yoshibayashi, Sagamihara, and Tadao Miyamura, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa-ken, Japan

Filed Aug. 28, 1970, Ser. No. 67,765

Claims priority, application Japan, Aug. 29, 1969, 44/68533

Int. Cl. H04b *3/04*

U.S. Cl. 333—18 **5 Claims**



Disclosed herein is automatic gain control circuitry for a transmission line of a PCM regenerative repeater, wherein such circuitry uses multistage variable equalizing networks. Each network has a variable reactance element, and has a predetermined pole frequency which is automatically varied under the control of its associated reactance element. The pole frequencies are changes in proportion to the square of a ratio of a standard line loss to a changed line loss due to the line loss variation, both measured in db. Thus, the pole frequency changes compensate for variation of the line loss.

3,671,887

DELAY LINE

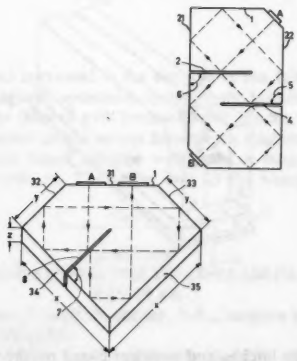
Rodney William Gibson, Haywards Heath, England, assignor to U.S. Philips Corporation

Filed Feb. 12, 1969, Ser. No. 798,665

Claims priority, application Great Britain, Feb. 16, 1968, 7,759/68

Int. Cl. H03h *9/30*

U.S. Cl. 333—30 **19 Claims**



An improved ultrasonic delay line comprising a solid glass body having one or more slits in the side walls extending inwardly from the outer edge faces of the body. The slits are arranged in the path of the propagating ultrasonic energy so as to effectively increase the number of energy transmission paths in the body by acting as additional energy reflecting surfaces. The slits extend the effective length of the delay line. The slits also operate to reduce undesired cross-coupling between the input and output transducers.

3,671,888

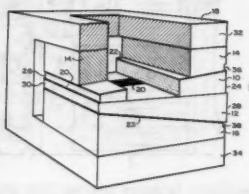
WIDE BAND STOP BAND FILTER INCLUDING A FERRITE REGION BIASED BY A GRADED MAGNETIC FIELD

Pedro A. Szente, San Jose, and Robert Joly, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 7, 1970, Ser. No. 95,528

Int. Cl. H01p *3/08;* **H03h** *7/04, 13/00*

U.S. Cl. 333—73 R **7 Claims**



A stripline conductor is sandwiched between two ferrite slabs which, in turn, are sandwiched between two magnetic pole pieces. The pole pieces are in contact with opposite poles of a permanent magnet, placing the ferrite slabs in a magnetic field. The distance between the pole pieces varies along the length of the stripline, causing the magnetic field to be nonuniform. The ferrite slabs will absorb electromagnetic radiation at a frequency determined by the magnetic field strength and thus signals on the stripline will be absorbed in a frequency band determined by the range of magnetic field strengths along the length of the stripline.

3,671,889

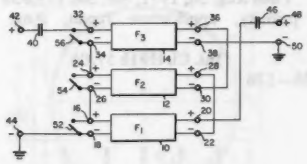
BROADBAND COMPOSITE FILTER CIRCUIT

Hollice A. Favors, 5154 Chimineas Ave., Tarzana, Calif.

Filed June 1, 1970, Ser. No. 42,381

Int. Cl. H03h *7/08*

U.S. Cl. 333—76 **6 Claims**



A broadband composite filter circuit is disclosed which includes a plurality of filter networks, each being tuned to respond to a respective frequency bandwidth of electrical signals. Each of the filter networks is a four terminal filter network having a positive and a negative network input terminal and a positive and a negative network output terminal. The input terminals of all of the filter networks are connected in series with each other in a first predetermined order. The output terminals of all of the filer networks are connected in a series circuit with each other in a second predetermined order which is the opposite to the above mentioned first predetermined order. The input signal is then applied across the series input circuits and the output signal is derived from across the

series output circuits. A switch is provided across the input terminals of each of the filter networks to enable each network to be selectively shorted out of the composite circuit to selectively vary the overall frequency response characteristic of the composite filter circuit.

3,671,890

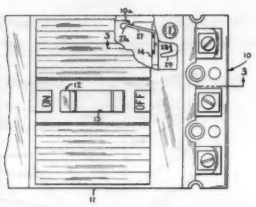
MANUALLY OPERABLE MOLDED CASE CIRCUIT BREAKER WITH SPECIAL TRIP TESTING MEANS

Keith W. Klein, Simsbury, and Herbert M. Dimond, West Hartford, both of Conn., assignors to General Electric Company

Filed March 31, 1971, Ser. No. 129,915

Int. Cl. H01h *73/12*

U.S. Cl. 335—22 **5 Claims**



A molded case circuit breaker with manually operable ON-OFF handle means, and a separate rotatable trip testing button in an opening in the cover of the breaker casing and flush with the surface thereof. The trip testing button includes two parts which when assembled trap the button rotatably in the casing cover. The interior portion of the trip testing button has two angularly extending arms and is of resilient plastic material. One of the arms engages the circuit breaker trip bar when the button is rotated, and causes tripping. The other arm of the trip testing button is thin and elongated and serves to position the button in normal unoperated position and to act as a spring to return the button from trip operating position to its normal position. Positive stops are also provided for limiting rotation in each direction.

3,671,891

SMALL TYPE ELECTROMAGNETIC CONTACTOR

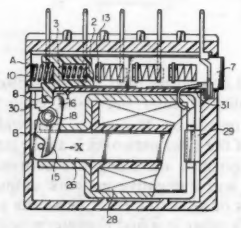
Yushito Usui; Kenji Shiojima, both of Seto, and Toshikatsu Hatakeyama, Owari Asahi, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 30, 1971, Ser. No. 175,833

Claims priority, application Japan, Aug. 31, 1970, 45/76971

Int. Cl. H01h *51/06*

U.S. Cl. 335—126 **4 Claims**



A small type electromagnetic contactor wherein a turning frame is rotatably bridged between a pair of opposing slots in a case having a build-in electromagnetic device, and actuating arm of an actuating rod member slidably mounted in an upper case member is disposed to be in contact with said turning frame.

3,671,892

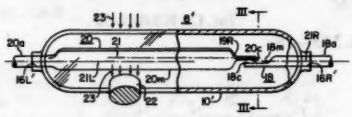
WIPING CONTACT REED SWITCH

Bruce G. Eaton, deceased, late of Baltimore, Md. (by First Pennsylvania Bank and Trust Co., executor), assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 16, 1970, Ser. No. 29,156

Int. Cl. H01h *1/18, 1/50, 51/28*

U.S. Cl. 335—154 **9 Claims**



A reed switch containing two reeds at least one of which is controlled by a means for producing a magnetic field. Each reed or beam is twisted along a longitudinal axis such that during operation the means for creating a magnetic field is disposed perpendicular to one of the resulting surfaces and pulls one reed into physical contact with the other in such a direction that the contact surfaces are flush. A wiping action follows between the faces of the contacting surfaces in a direction parallel to the planes of the contacting surfaces due to a component of motion in the direction of the minimum flexure axis of the moving beam.

3,671,893

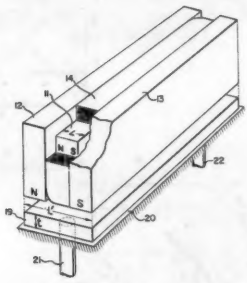
MAGNETIC LATCH AND SWITCH USING COBALT-RARE EARTH PERMANENT MAGNETS

Robert F. Edgar; Francois D. Martzloff, both of Schenectady, and Russell E. Tompkins, Scotia, all of N.Y., assignors to General Electric Company

Filed Nov. 18, 1970, Ser. No. 90,676

Int. Cl. H01h *51/27*

U.S. Cl. 335—179 **4 Claims**



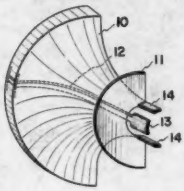
Magnetic latches and switches based on the flux cancellation or flux diversion principle use the high coercive force of cobalt-rare earth permanent magnets such as cobalt-samarium. These permanent magnets are not demagnetized by a flux cancellation coil and can be made thin in the field direction. Devices with thin magnetic circuits and low volume armature achieve high unlatching speeds.

3,671,894

DEFLECTION YOKES FOR CATHODE RAY TUBES

Eiji Sawada, Tokyo, Japan, assignor to Denki Onkyo Company, Limited, Tokyo, Japan

Filed April 15, 1970, Ser. No. 28,627
Claims priority, application Japan, April 18, 1969, 44/35196
Int. Cl. H01f 7/00
U.S. Cl. 335—210 4 Claims



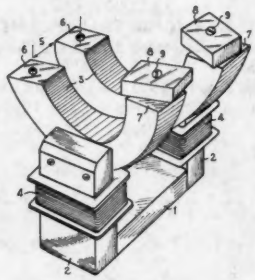
A deflection yoke for use in a cathode ray tube comprises a yoke bobbin, at least two pairs of segments projecting axially from the rear edge of the yoke bobbin and means for clamping the segments about the cathode ray tube to secure thereon the deflection yoke.

3,671,895

GRADED FIELD MAGNETS

Jeanne Aucouturier, and Rene Lacaze, both of Paris, France, assignors to Thomson-CSF

Filed April 27, 1970, Ser. No. 32,258
Claims priority, application France, May 5, 1969, 6914229
Int. Cl. H01f 1/00
U.S. Cl. 335—212 1 Claim



A lens effect is created at the entry to or the exit from, the airgap of a magnetic system by equipping the terminal faces of the polepieces thereof with ferromagnetic blocks, which are pivotally mounted on the output faces of the magnetic yoke so that the airgap has a variable width and a magnetic field gradient is produced. The upper face of the blocks may be sloped.

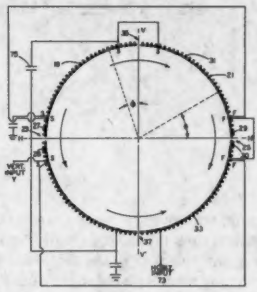
3,671,896

DEFLECTION SYSTEM FOR TRIAD-BEAM CATHODE RAY TUBE

Charles Edward Torsch, Rochester, N.Y., assignor to Sylvania Electric Products Inc.

Continuation of Ser. No. 841,893, July 15, 1969, abandoned.
This application May 21, 1971, Ser. No. 145,884
Int. Cl. H01f 5/00
U.S. Cl. 335—213 22 Claims

A cathode ray tube deflection system includes a triad-type cathode ray tube and a toroid-type deflection yoke having horizontal and vertical axes with first and second horizontal windings symmetrical to the horizontal axis in mirror image of one another about the vertical axis and first and second vertical winding symmetrical to the vertical axis in mirror image of one another about the horizontal axis and said first and second horizontal and vertical windings each including a flux altering means for enhancing vertical convergence of horizontal trace lines. The deflection yoke is formed by a process wherein a core of magnetic material is wrapped with wire turns applied in toroidal fashion to form first and second horizontal



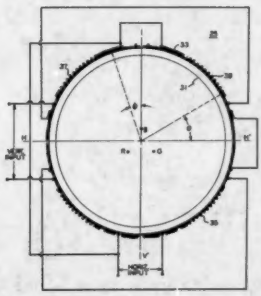
windings and first and second vertical windings advanced in opposite circumferential direction to form a mirror image relationship. Also, "ringing" is inhibited by circuitry wherein a specific terminal of each of the horizontal and the vertical windings associated with the start of electron beam scanning of the cathode ray tube is connected to a potential reference level while the other extremities of the horizontal and vertical windings are connected to a source of deflection signals whereby undesired distortions appearing on the trace lines of the viewing screen are minimized.

3,671,897

ASYMMETRICAL-WOUND TOROID YOKE CATHODE RAY TUBE DEFLECTION SYSTEM

Charles Edward Torsch, Geneva, N.Y., assignor to GTE Sylvania Incorporated

Filed July 8, 1971, Ser. No. 160,865
Int. Cl. H01f 5/00
U.S. Cl. 335—213 15 Claims

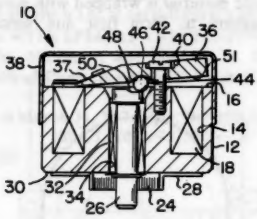


A color cathode ray tube deflection system includes a color cathode ray tube having triad-arrayed electron guns, a toroid deflection yoke having deflection windings symmetrical to the vertical axis and asymmetrical to the horizontal axis of a core of magnetic material, and dynamic convergence means for effecting radial movement of electron beams from said electron guns whereby horizontal and vertical trace lines on a viewing screen of the cathode ray tube are converged.

3,671,898
ROTARY SOLENOID

Raymond J. Ganowsky, Clifton Springs, N.Y., assignor to Cliftronics, Inc., Clifton Springs, N.Y.

Filed Nov. 27, 1970, Ser. No. 93,361
Int. Cl. H01f 7/08
U.S. Cl. 335—228 16 Claims

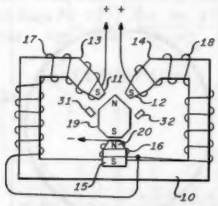


In a rotary solenoid employing a hinged armature, an output shaft and converter means including a ball located between oppositely inclined cam surfaces in the armature and the output shaft, for converting arcuate movement of the armature to rotary movement of the shaft upon energization of the solenoid, the improvement wherein the various cams in the output shaft are double cams of different length and opposite inclination joined at their deep end. Preferably the output shaft employs two pairs of such double cams arranged in diametrically opposed locations on the shaft, and including for example, a 90° RH cam joined to a 15° LH cam and also a 90° LH cam joined to a 15° RH cam. The armature can have either a single cam or a double cam comprising two cams of different length and opposite inclination. Depending on the direction of the torsion return spring, the solenoid can be set up for either left hand or right hand operation. Further, the use of the double cams according to the present invention reduces the tooling and stocking requirements of the manufacturer.

3,671,899
PERMANENT MAGNET DETENT MEANS FOR A ROTARY SOLENOID

Charles E. Clift, Phoenix, Ariz., assignor to Sperry Rand Corporation

Filed April 30, 1971, Ser. No. 139,102
Int. Cl. H01f 7/08
U.S. Cl. 335—253 14 Claims

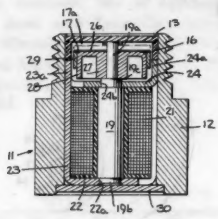


An electromagnetic rotary solenoid having a permanent magnet rotor and a plurality of selectable coils utilizes the combination of a permanent magnet and a coil for the no signal or detent position to effect a rotation restraining force on the rotor during a no signal input. The circuit effecting the operation of the solenoid simultaneously energizes the appropriate selectable coil and the coil associated with the permanent magnet whereby the selectable coils magnetic field creates a torque acting on the rotor to position it and the magnetic field of the coil associated with the permanent magnet nulls out the restraining force of the permanent magnet.

3,671,900
ROTARY ACTUATOR AND INDICATOR

Eugene F. Loughran, Jr., Oakville, Conn., assignor to North American Philips Corporation, Waterbury, Conn.

Filed Aug. 25, 1969, Ser. No. 852,634
Int. Cl. H01h 50/18
U.S. Cl. 335—272 15 Claims

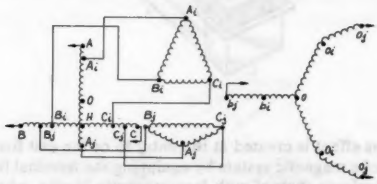


An indicator having an armature with spaced magnetic poles mounted to pivot back and forth on its axis to match indicia on the armature with fixed indicia at each end position of the pivotal motion. The armature poles are attracted alternately to the two end positions by stator poles energized by a coil supplied with current that corresponds in magnitude or direction of flow with the operating condition under surveillance. Pivotal motion of the armature is limited by a pin, either on the armature or on the stator, that fits into an annular slot in the stator or armature. The armature can move axially to a limited extent, and to hold the disc in either of its limit positions, the ends of the slot are further axially indented to receive the pin. The armature is free to move axially far enough to disengage the pin from the indentations but not completely free of the slot.

3,671,901
ANTI-HARMONIC TRANSFORMER

Jacques Francois Marie-Joseph Lys, 3 bis Place Marquis 92, Clamart, France

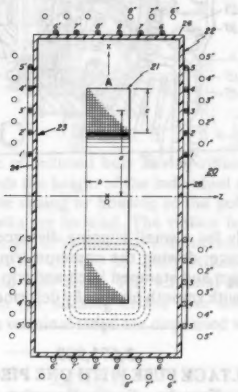
Filed Jan. 18, 1971, Ser. No. 107,048
Claims priority, application France, Jan. 19, 1970, 7001717
Int. Cl. H01f 33/00
U.S. Cl. 336—5 6 Claims



Devices for eliminating in a three-phase voltage transformer T, separating two networks A and B the voltage harmonics preexisting within the three phase voltage feeding A and detrimental to B, or the current harmonics generated by B and detrimental to A. The devices include single phase transformers, the primary windings of which are "delta" coupled and the secondary windings of which are "star" coupled, the angles determined by the legs of the triangles and of the stars exhibiting unique values, together with single phase autotransformers for connection to the A and B networks. When eliminating only current harmonics, T need only be constituted of two single phase transformers the primary secondary windings of which are in quadrature together with single phase transformers, the windings of which are connected to specific current taps provided on the above-mentioned trans-

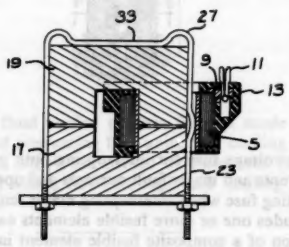
formers. They can be used in installations for electrochemistry, electrometallurgy, power distribution of d.c. current and for installations of static power conversion.

3,671,902
SHIELDED INDUCTIVE DEVICE
Willem F. Westendorp, Schenectady, N.Y., assignor to General Electric Company
Filed May 25, 1971, Ser. No. 146,696
Int. Cl. H01f 15/04
U.S. Cl. 336—84 **10 Claims**



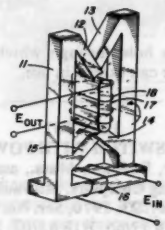
Cylindrical superconductive coil is shielded to provide net zero magnetic field exterior of a cylindrical shield located a predetermined distance from the coil by winding about the shield, and about the ends thereof, winding which carry predetermined currents sufficient to just neutralize the external field due to the current in the coil at the shield.

3,671,903
NON-INFLAMMABLE HORIZONTAL OUTPUT TRANSFORMER
William L. Arrington; Wayne Carlton Gantt, both of Batavia, and Leonard Joseph Gouger, Albion, all of N.Y., assignors to GTE Synvania Incorporated
Filed Feb. 8, 1971, Ser. No. 113,463
Int. Cl. H01f 27/26, 27/30
U.S. Cl. 336—96 **4 Claims**



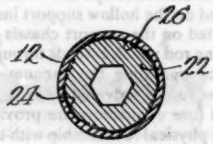
A non-inflammable horizontal output transformer includes a coil member having a plurality of leads extending therefrom, an arcuate ring member affixed to the coil member with a plurality of contact pins extending outwardly therefrom and connected to the leads, an envelope of non-inflammable material surrounding the coil member, ring member, and leads and the coil member supported by a hollow insulator telescoped over a pair of confronting leg members of a pair of U-shaped core members positionally held by a U-shaped wire member.

3,671,904
PICK-OFF
Everett R. Tribken, Scottsdale, Ariz., and Frederic L. Miller, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy
Continuation of Ser. No. 795,769, Jan. 16, 1969, abandoned.
This application Jan. 22, 1971, Ser. No. 109,027
Int. Cl. H01f 21/06
U.S. Cl. 336—132 **5 Claims**



An electrical pick-off for measuring small quantities of angular rotation. An exciting coil energizes a core having two pairs of poles, spaced relatively close together. An output coil is located between the poles and has a low magnetic reluctance core arranged to move within the coil although the coil is fixed with respect to the pole pieces.

3,671,905
INTERNALLY POLYGONAL COIL FORM
John O. Renskers, Crystal Lake, Ill., assignor to Coilcraft, Inc., Cary, Ill.
Filed Oct. 26, 1971, Ser. No. 191,993
Int. Cl. H01f 21/06
U.S. Cl. 336—136 **4 Claims**

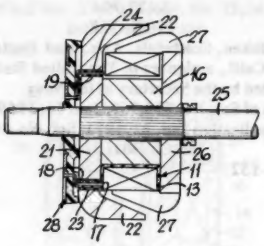


A low cost tubular coil form having regularly spaced flats on the inside surface thereof for improved tuning core retention.

3,671,906
WINDING FORMERS FOR USE IN THE MANUFACTURE OF ROTOR ASSEMBLIES FOR DYNAMO ELECTRIC MACHINES
John Barry Hodges, 155, The Crescent, Walsall, and Gordon Howard Maybury, 14, Ashlawn Crescent, Solihull, both of England
Filed Oct. 29, 1970, Ser. No. 85,180
Int. Cl. H01f 27/30
U.S. Cl. 336—208 **3 Claims**

A winding former including a tubular, flexible cylindrical portion having an integral peripheral outwardly extending flange at each end thereof. The cylindrical portion and the

flanges are formed with a split which extends the full length of the former so that the former can be compressed radially. One



of the flanges has a hole through which one end of a coil wound on the former can extend in use.

3,671,907

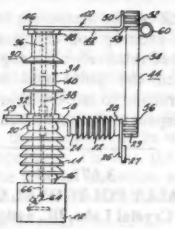
VACUUM SWITCH WITH POWER FUSE

Richard G. Brunner, Dedham, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 23, 1970, Ser. No. 92,030

Int. Cl. H01h *33/66*; **H1h** *85/02*; **H01h** *85/54*

U.S. Cl. 337—4 **6 Claims**



A vacuum switch used for switching high voltage capacitive loads comprises a support chassis on which a hollow support insulator is mounted. One or more vacuum interrupters, each comprising an insulated envelope and relatively movable contacts, are mounted on the hollow support insulator. Operating means are mounted on the support chassis and comprises an insulated operating rod which extends through the hollow support insulator for operating the vacuum interrupter(s). A replaceable power fuse is provided. Means, including a stand-off insulator and fuse connectors are provided to mount the switch in parallel physical relationship with the hollow support insulator and to electrically connect the fuse in series circuit with the vacuum interrupter(s). In one embodiment, a single vacuum interrupter is provided and it is disposed in parallel physical relationship with the hollow support insulator. In other embodiments, a plurality of vacuum interrupters are provided which are transversely disposed with respect to the hollow support insulator. In one of the other embodiments, one of the vacuum interrupters is physically located within the stand-off insulator.

3,671,908

CIRCUIT BREAKER

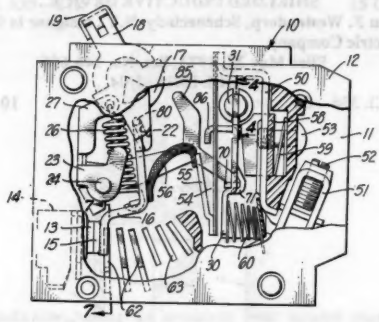
Harold E. Belttary, West Covina, and John G. Palmer, Pasadena, both of Calif., assignors to Zinsco Electrical Products, Los Angeles, Calif.

Filed April 10, 1970, Ser. No. 27,395

Int. Cl. H01h *71/16*

U.S. Cl. 337—54 **13 Claims**

A circuit breaker switch with thermal and magnetic tripping, with the thermal element positioned between the tripping mechanism pivots permitting increased contact force for a given latch load. A common trip for multipole switches with the overload latch and the common trip linkage having a common pivot axis, but independent pivots, with the latch



moving freely for a small tripping distance and on moving a greater distance, driving the common trip linkage. An open arc plate design and stamped latch and trip arm having engaging surfaces with smooth plastically deformed edges.

3,671,909

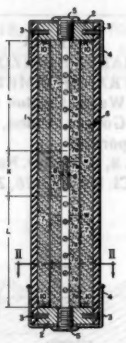
HIGH-VOLTAGE FUSE WITH ONE PIECE FUSE LINKS

Frederick J. Kozacka, South Hampton, and Richard A. Belcher, Hampton Falls, both of N.H., assignors to The Chase-Shawmut Company, Newburyport, Mass.

Filed Feb. 17, 1971, Ser. No. 116,037

Int. Cl. H01h *85/10*, *85/12*

U.S. Cl. 337—160 **12 Claims**

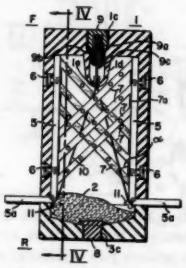


A high-voltage fuse for interrupting both protracted overload currents and major fault currents and operating as a current-limiting fuse when interrupting major fault currents. The fuse includes one or more fusible elements each operating in the fashion of a composite fusible element including serially connected ribbon sections and a wire section interposed between, and spot-welded to, the ribbon sections. In fuses according to this invention one single stamping, i.e. one single length of sheet silver stock takes the plate of a spot-welded composite of ribbon sections and a wire section. The wire like effect is achieved by providing an oblong hole, or window, in the center region of the ribbon fuse link, resulting in the formation of two wire-like strips of small cross-sectional area to both sides of the oblong hole or window.

3,671,910
COMPACT POLYPHASE FUSE

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Dec. 8, 1970, Ser. No. 96,110
Int. Cl. H01h *71/20*
U.S. Cl. 337—146 9 Claims

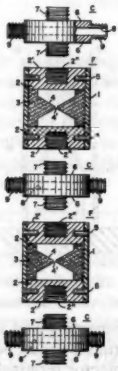


A polyphase fuse of reduced bulk having ribbon fuse links whose length exceeds the height of the individual chambers or compartments of the casing or housing of the polyphase fuse wherein the fuse links are located. The ribbon fuse links are conductively connected to terminal or conductor strips whose juxtaposed surfaces are—or may be—fully utilized for the arrangement of ribbon fuse links. The terminal strips are individually affixed to the housing of the fuse and insulating spacers between the terminal strips are dispensed with.

3,671,911
SYSTEM OF FLUID COOLED FUSES

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Dec. 10, 1970, Ser. No. 96,761
Int. Cl. H01h *85/04*
U.S. Cl. 337—166 7 Claims



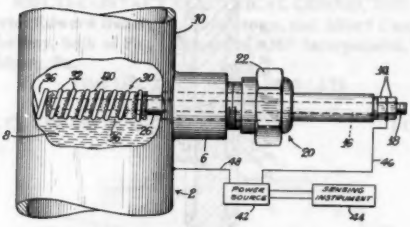
A system of fluid cooled electric fuses is made up of a modular stack of alternating fuse units, and cooling units, or heat exchangers, which are cooled by transverse flows of a cooling medium which flows through said cooling units, or heat exchangers.

3,671,912
LIQUID MOISTURE DETECTOR

Leo S. La Sota, Heidelberg, Pa., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Feb. 22, 1971, Ser. No. 117,359
Int. Cl. H01c *13/00*
U.S. Cl. 338—34 10 Claims

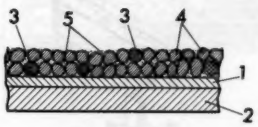
Detector apparatus or a moisture detection device is disclosed as having an electrode rod extending from the exterior of an enclosure containing insulating oil into the interior of the enclosure and a hollow electrode positioned coaxially around the rod electrode within the enclosure. The rod electrode is electrically insulated from the enclosure and hygroscopic material is positioned between the hollow electrode and the rod electrode and contacted by the insulating oil through at least one opening in the hollow electrode so that any moisture in the fluid will be taken up by the hygroscopic material. The rod electrode, the moisture in the hygroscopic material and the hollow electrode form an electrically conductive circuit connnected to a power source and to sensing instrumentation that will indicate, for example, current conducted by the circuit to thereby indicate the amount of moisture in the hygroscopic material and thus the amount of moisture in the insulating oil.



3,671,913
AGING-PROOF HUMIDITY SENSING ELEMENT AND METHOD FOR THE PRODUCTION THEREOF

Shigeo Mamiya, and Ryoichiro Yajima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed March 18, 1970, Ser. No. 20,620
Claims priority, application Japan, March 19, 1969, 44/20430
Int. Cl. H01c *13/00*
U.S. Cl. 338—35 11 Claims

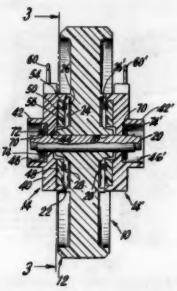


A humidity sensing element comprises an insulating base plate provided with gold electrodes and a film or layer metal oxide particles or a mixture of metal oxide particles and carbon particles. The micro-gaps between said particles are filled up with a hydrophilic high polymer, thereby minimizing the deterioration by aging. The humidity sensing element can be produced by a method which comprises forming a film made of metal oxide particles or a mixture of metal oxide particles and carbon particles on an insulating base plate provided with gold electrodes, immediately whereupon said film is impregnated with a solution of a hydrophilic high polymer in a water-miscible volatile solvent and subsequently volatilizing off said solvent. The thus produced humidity sensing element shows a substantially constant electric resistance at a given humidity even with the passage of a long period of time, thereby enabling a hydrometer capable of exactly indicating humidity with high durability to be provided.

3,671,914
ROTARY POTENTIOMETER

Hans H. Wormser, New Milford, N.J., assignor to Markite Corporation, New York, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,314
Int. Cl. H01c 9/02
U.S. Cl. 338—131 15 Claims

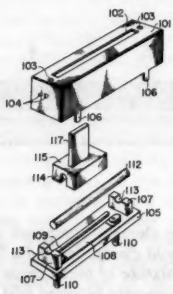


In a ganged potentiometer assembly, two elements containing a resistance track and a collector track are rigidly and nonrotatably mounted in support structure in spaced opposition to each other. An intermediate, rotatable wheel, loosely journaled on a shaft that extends between the two potentiometer elements, is provided with opposite facing wiper means which are in contact with the resistance and the collector tracks.

3,671,915
SLIDING TYPE VARIABLE RESISTOR

Nobuyuki Sasaki, Neyagawa; Shunzo Oka, Hirakata, and Tadashi Yano, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 26, 1971, Ser. No. 109,924
Claims priority, application Japan, Jan. 30, 1970, 45/9923; Jan. 30, 1970, 45/9924; Jan. 30, 1970, 45/9925; Jan. 30, 1970, 45/9926; Jan. 30, 1970, 45/9927
Int. Cl. H01c 9/02
U.S. Cl. 338—183 6 Claims

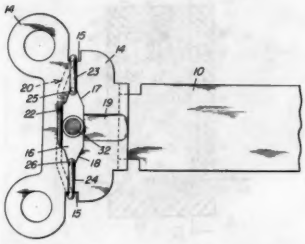


A sliding type variable resistor having a resistance element and a conductive element mounted in parallel with each other on a dielectric base, a slider having a conductor on its lower surface, a guide rail for guiding the sliding movement of the slider, a housing covering the dielectric base for accommodating thereinside the slider and the guide rail, and an operating means fixed to the slider and projecting to the exterior through a slot in the upper wall of the housing. In the variable resistor, supporting pedestals are provided at longitudinal opposite end portions of the dielectric base for supporting the opposite ends of the guide rail thereby to ensure smooth and stable sliding movement of the slider.

3,671,916
SINGLE SPRING WIRE GROUND CLIP

John J. Opalenik, New Britain, Conn., assignor to Arrow-Hart, Inc., Hartford, Conn.

Filed April 14, 1971, Ser. No. 133,965
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 5 Claims

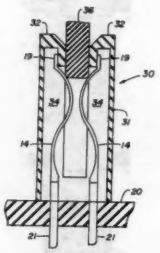


A wire grounding clip uses only one spring wire member provided to engage the securing screw, and a portion of the bridge is pressed out of the plane of the bridge as an abutment in position to support the securing screw against the pressure of the spring wire, so as to hold the screw in a position perpendicular to the bridge to facilitate assembly into the metal box.

3,671,917
PRINTED CIRCUIT BOARD CONNECTOR

John P. Ammon, and Frederick T. Inacker, both of Dallas, Tex., assignors to Ammon & Champion Company, Inc., Dallas, Tex.

Filed May 20, 1970, Ser. No. 38,989
Int. Cl. H05k 1/07
U.S. Cl. 339—17 L 12 Claims



An apparatus for connecting and terminating contact fingers on the edge of a printed circuit board to connect them to external circuitry. Connector terminals are press fitted into a board and an insulative housing is snapped over the top of the terminals. The structure of the insulative housing permits the contactor portions of the terminals to be preloaded to the proper gap and tension and further provides a closed entryway for a printed circuit board to protect the terminal ends from damage during connection.

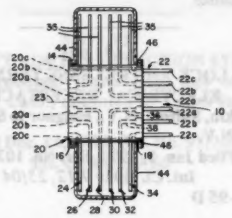
3,671,918
INTRACONNECTOR WIRING CHANGE MODULE

John E. Mitchell, Culver City, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed April 28, 1969, Ser. No. 819,903
Int. Cl. H01r 29/00
U.S. Cl. 339—18 R 13 Claims

The module is provided with input and output electrical contacts which are arranged to receive conventional cable ter-

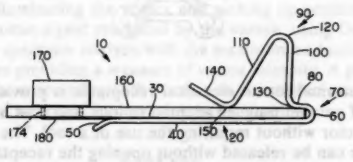
minations. The input and output contacts are respectively brought out from the interior of the module body to exposed connection pins. There are as many exposed connection pins as there are input and output contacts. Connections are made between or among the several connection pins by conventional means in order to change the scheme or arrangement of wiring connections in an electronic apparatus to another connection scheme. An insulating and sealing cover or permanent potting may be placed over the pins to protect the newly made connections.



3,671,919
PROTECTIVE CLIP AND ELECTRONIC ASSEMBLY USING THE SAME

Samuel L. Kauffman, Newtown, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 9, 1971, Ser. No. 113,975
Int. Cl. H01r *31/08*
U.S. Cl. 339—19 **5 Claims**

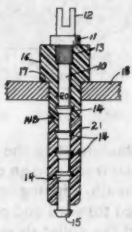


An electronic module which comprises a printed circuit board, on which is mounted an MOS integrated circuit module, utilizes a resilient, stainless steel clip secured to the edge of the board to short out the conductive circuit runs to the integrated circuit module and to mask them from the solder bath in a wave soldering machine through which the printed circuit board is passed.

3,671,920
INSULATED ELECTRIC TERMINAL ASSEMBLY

James F. Iantorno, Mamaroneck; John Wagner, Pleasantville, and Stephen J. Schumacher, Larchmont, all of N.Y., assignors to Sealectro Corporation, Mamaroneck, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,961
Int. Cl. H01r *13/40*
U.S. Cl. 339—59 R **6 Claims**

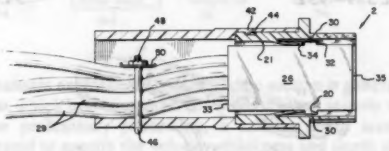


A conductive metal terminal with contact making portions extending above and below a metal panel. A two-piece insulating assembly permits the terminal to be inserted into a hole in the metal panel. Then, upon application of a tool, the bottom half of the insulator assembly is forced toward the panel and locks the terminal into place. The bottom half of the insulator is retained in its locked position by barb-like annular flanges. The top half of the insulator rests against a flanged head on the metal terminal.

3,671,921
MULTI-CONTACT ELECTRICAL CONNECTOR

Charles Edward Baker, III, Middletown, and Albert Casciotti, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 28, 1970, Ser. No. 84,678
Int. Cl. H01r *13/48*
U.S. Cl. 339—59 M **1 Claim**

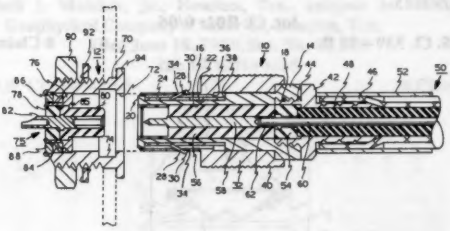


Multi-contact Connector Assembly comprises plug and receptacle which contain matable contact terminals. Both plug and receptacle comprise a molded plastic shell member and a molded insert having contact cavities therein, terminals being contained in the insert cavities.

3,671,922
PUSH-ON CONNECTOR

William Max Erich Zerlin, Newtown; Roger Peter Avery, Bethel, and David Hugh Royce, Brookfield, all of Conn., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Aug. 7, 1970, Ser. No. 61,923
Int. Cl. H01r *13/54*
U.S. Cl. 339—74 R **6 Claims**



A locking push-on, pull-off connector which maintains good electrical contact even under conditions where there is movement in the connector. The contact elements of one of the mating connector members are mounted for axial movement in the member and are normally biased by a resilient means to a forward-most position. Leading surfaces of mating contact elements in the two members are adapted to bear against each other to make electrical contact when the members are mated with the elements which are mounted for movement being adapted to be moved back to a predetermined position in their member by the force applied to them by the other contact element. This movement is against the force of the resilient means. A means is provided for locking the contact members together with the moveable element in the predetermined position. The locking means includes a bore in one of the mating members which is sized to accept a leading portion of the other member, said bore having an enlarged internal counterbore, and a wrap spring mounted on the leading portion of the first member. The wrap spring has tabs projecting at an angle

to the connector axis which tabs are adapted to be compressed by the walls of the bore as a leading portion of the member is fitted into the bore and to expand into the enlarged counterbore to lock the members together. A sleeve is mounted for movement in an axial direction on the spring-containing member. This sleeve has openings through which the tabs normally project, the walls of the sleeve being moved over the tabs to compress them and unlock the members as the sleeve is moved in a rearward direction.

3,671,923

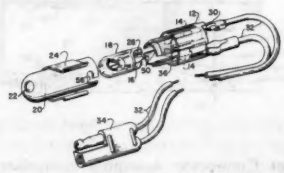
LAMP SOCKET

Lawrence E. Rieth, Springfield, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed May 3, 1971, Ser. No. 139,682

Int. Cl. H01r *33/12*

U.S. Cl. 339—93 L **5 Claims**



The following specification describes a lamp socket insulator having integrally formed cantilever extension walls for supporting a lamp electrically connected to a pair of wedge type electrical receptacles carried by the socket with a lamp housing engaged with the insulator in turn encircling and supporting the extension walls.

3,671,924

ELECTRIC CONNECTOR

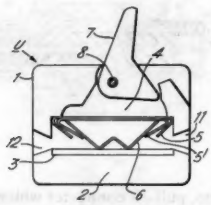
Hideo Nagano, 13-5, 5-chome Shimo-Meguro, Tokyo, Japan

Filed Sept. 23, 1970, Ser. No. 74,742

Claims priority, application Japan, Sept. 24, 1969, 44/90955

Int. Cl. H01r *9/06*

U.S. Cl. 339—95 D **8 Claims**



An electric connector for electrically connecting various electric wires and plugs in a very simple manner comprises a housing made of electrically insulating material, an electrically conductive place, a spring means disposed above said electrically conductive plate and consisted of a retaining plate spring having an end turned back inwardly at an angle larger than 90° and a clamping plate spring disposed underneath said retaining plate spring, and an operating member movably disposed above said spring means so as to assume a first position and a second position. In said first position of said operating member a conductor to be connected is allowed to be inserted into said electric connector and in said second position of said operating member, said spring means is depressed to urge said conductor against said electrically conductive plate. The electric connector further comprises a means for supporting said spring means in such a manner that when said operating member is in said first position, there can be formed a spacing between said spring means and said electrically conductive plate sufficient for inserting said conductor therebetween without striking against said spring means so as to connect said conductor electrically and mechanically in a very stable manner.

3,671,925

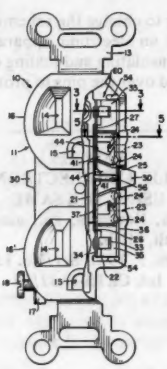
PRESSURE LOCK AND RELEASE TERMINAL FOR AN ELECTRICAL RECEPTACLE

William Drapkin, Suffolk, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Filed Jan. 5, 1971, Ser. No. 103,991

Int. Cl. H01r *9/12, 23/04*

U.S. Cl. 339—95 D **12 Claims**



A terminal for an electrical receptacle is provided with a pair of parallel tongues adapted to lock and hold a bare wire conductor without requiring the use of a tool. The wire conductor can be released without opening the receptacle by inserting a tool through a tool access notch and engaging a pair of release tabs on the wire gripping tongues.

3,671,926

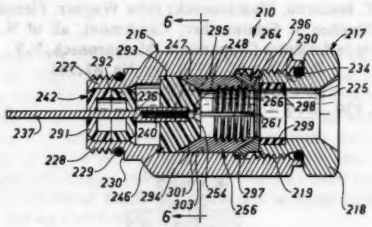
COAXIAL CABLE CONNECTOR

Zdenek Nepovim, Lindsay, Ontario, Canada, assignor to Lindsay Specialty Products Limited, Lindsay, Ontario, Canada

Filed Aug. 3, 1970, Ser. No. 60,410

Int. Cl. H01r *17/04, 7/06*

U.S. Cl. 339—177 E **11 Claims**



A connector for attachment to the end of a coaxial cable having an axial core electrode and an outer conductive sheath electrode includes a sheath-gripping ferrule and a collet sleeve for gripping an exposed forward end portion of the core electrode. The ferrule and the collet sleeve are disposed within a tubular housing and a plug bolt is threaded into the rearward end of the connector for tightening both the ferrule and the collet sleeve radially inwardly against the electrodes. Forward axial movement of the plug bolt is converted to forward and

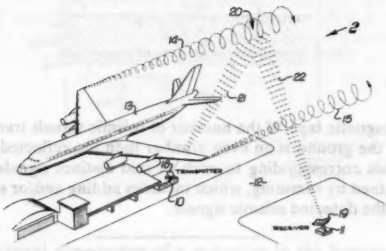
radially inward movement of the sheath-gripping ferrule through a first pair of co-acting frusto-conical cam surfaces and the resulting movement of the ferrule is operative through at least one second pair of frusto-conical cam surfaces to cause radially inward compression of the collet sleeve onto the exposed forward end portion of the core electrode.

3,671,927

AIRCRAFT VORTEX DETECTION SYSTEM

Andrew Peter Proudian, Chatsworth, and Martin Balser, Covina, both of Calif., assignors to Xonics Inc., Van Nuys, Calif.

Filed Dec. 14, 1970, Ser. No. 97,765
Int. Cl. G01s 9/66
U.S. Cl. 340—1 R 10 Claims



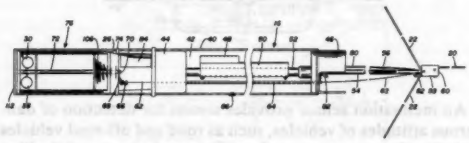
A system for detection and measurement of aircraft wing tip vortices. An acoustic radar with transmitter and receiver spaced from each other in a plane perpendicular to the flight path for illuminating the vortex and picking up scattering of the transmitter signal produced by the vortex, using Doppler frequency spectrum analysis with the maximum and minimum frequencies providing a measure of vortex intensity. A plurality of receivers operating with a common transmitter providing coverage of an area of interest along a flight path.

3,671,928

AUTOMATICALLY ENERGIZABLE SONOBUOY

James F. Schultz, Dallas, Tex., assignor to Aquatronics, Dallas, Tex.

Filed May 21, 1970, Ser. No. 39,362
Int. Cl. H04b 1/59
U.S. Cl. 340—2 11 Claims



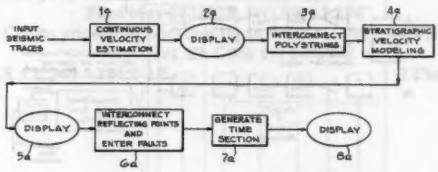
A buoy housing includes flotation structure and an antenna movable from a retracted position inside the housing to an extended position outside the housing. An acoustic transducer is contained within a lower compartment in the housing and is attached to the housing by a flexible line. A transmitter is contained within the buoy housing and is operable to transmit from the antenna radio signals representative of acoustic signals received by the acoustic transducer. Structure is provided in the buoy housing which is responsive to contact with water for moving the antenna to the extended position and for lowering the acoustic transducer from the housing into the water for a preselected depth. A time delay device delays the lowering of the acoustic transducer from the housing for a predetermined time after the housing is placed in the body of water, in order to avoid entanglement of the acoustic transducer with towed streamers and the like.

3,671,929

CONVERSION OF SEISMIC DEPTH SECTIONS TO SEISMIC TIME SECTIONS

William H. Ruehle, Duncanville; John D. Hodge, Jr., Dallas, and William C. Gray, Houston, all of Tex., assignors to Mobil Oil Corporation

Filed Jan. 20, 1970, Ser. No. 4,382
Int. Cl. G01v 1/00
U.S. Cl. 340—15.5 FC 8 Claims



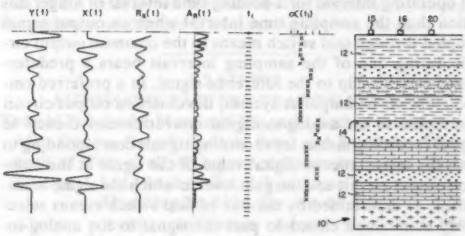
In seismic exploration, a seismic time section is generated in a form which can be compared to the original seismic traces. In the preliminary processing, a seismic depth section is generated to specify the velocity, thickness and depth of each reflecting zone of the subsurface formation. For a particular reflecting zone, the coordinates of sampling points along the interface are generated. The ray path, normal to a sampling point and extending through successive layers to a surface coordinate point, is determined. From the velocity and thickness of each zone, the travel time of seismic energy between the sampling point and the surface coordinates is computed. Travel times are plotted as a function of the surface coordinates to generate a travel time curve. The foregoing procedure is repeated for succeeding reflecting zones to generate a time section which can be compared to the original seismic traces.

3,671,930

METHOD OF SEISMOGRAPHIC EXPLORATION BY MEASURING THE ATTENUATION COEFFICIENT IN GEOLOGIC SECTION

Emil J. Mateker, Jr., Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed June 18, 1970, Ser. No. 47,235
Int. Cl. G01v 1/28
U.S. Cl. 340—15.5 4 Claims

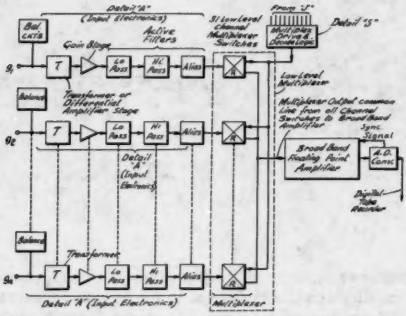


This invention pertains to a method of seismographic exploration. At an observation station reflected seismic signals from the reflected interfaces in a geologic section are recorded as an observed amplitude-time recording. At a reference station the reflected seismic signals are recorded as a reference amplitude-time recording. The reference recording is converted to a reflectivity function, and the observed amplitude-time recording is divided by the reflectivity function to obtain a desired amplitude function from which is derived a measure of the attenuation coefficient of the reflected seismic signals in the studied geologic section.

3,671,931
AMPLIFIER SYSTEM

Robert J. Loofbourrow, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 4, 1969, Ser. No. 855,204
Int. Cl. G01v 1/24
U.S. Cl. 340—15.5 GC 63 Claims



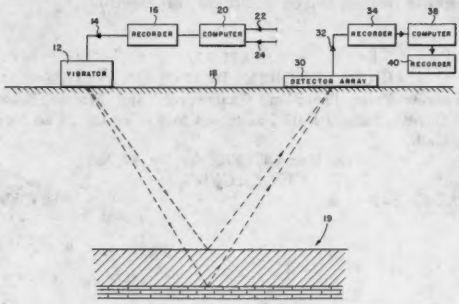
A multi-channel wide dynamic range automatic high speed digital gain ranging amplifier system having a common amplifier network for a plurality of channels together with a low level multiplexer means having a plurality of input circuits corresponding to the respective channels of the amplifier system, a common multiplexer output circuit coupled to the input of the common amplifier network and means for time sequentially switching the respective channels of the amplifier system to the input of the amplifier network during respective channel operating intervals. The common amplifier network contains a plurality of amplifier stages coupled in cascade circuit relationship, wherein improved bandwidth is provided by D.C. coupling between the successive cascaded stages together with a filter in a feedback path from the output of the last cascaded stage to the input of the first cascaded stage. The respective outputs of the amplifier stages are coupled through a common output circuit to a comparator circuit for comparison with a predetermined reference signal. Sequencing means are provided for momentarily closing switch means in timed sequence for sequentially coupling the respective outputs of the successive amplifier stages to the comparator circuit during successive, relatively brief sampling time intervals occuring within the respective channel operating interval. Means are provided for selectively maintaining one of the switch means in its closed position during the respective channel operating interval for a holding time interval of longer duration than the sampling time interval when an output signal coupled through said switch means to the common output circuit during one of the sampling intervals bears a predetermined relationship to the reference signal. In a preferred embodiment of the amplifier system, the common output circuit is coupled to an analog-to-digital converter and thence to digital recording means for recording signals corresponding to both the instantaneous digital value of the signal at the common output circuit and the gain level to which the signal is amplified, as determined by the one of said switch means selectively maintained closed to pass the signal to the analog-to-digital converter.

3,671,932
TWO-SWEEP SIGNAL TRANSMISSION AND RECEPTION IN SEISMIC EXPLORATION

Mark Holzman, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed May 4, 1970, Ser. No. 34,067
Int. Cl. G01v 1/22
U.S. Cl. 340—15.5 CP 4 Claims

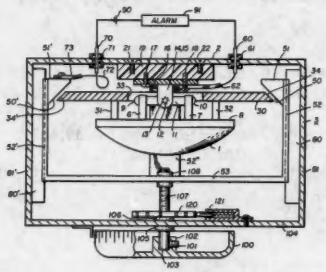
This invention contemplates a method of seismic exploration using vibrators which are driven simultaneously by the combination of two distinct sweep signals. The combined signal is obtained, for example, by adding or subtracting the two distinct signals. The reflected seismic signals are detected in the usual fashion and recorded on a recording medium such as magnetic tape. If the number of seismic signals transmitted into the ground is an even number then the reflected seismic signals corresponding to each of said distinct signals can be obtained by summing, which includes adding and/or subtracting, the detected seismic signals.



3,671,933
VEHICULAR TILT SENSOR HAVING MARGIN OF SAFETY ADJUSTMENT

Billy W. Barnes, Durham, N.C., assignor to Sperry Rand Corporation

Filed Feb. 2, 1970, Ser. No. 7,616
Int. Cl. H01h 35/02
U.S. Cl. 340—52 H 1 Claim



An inclination sensor provides means for detection of dangerous attitudes of vehicles, such as road and off-road vehicles including farm tractors, earth-moving equipment, and the like, whether caused by negligence on the part of the operator or by accident. The sensor provides a warning signal or automatically controls the vehicle so that it does not upset thereby endangering the life of the operator or others in its vicinity.

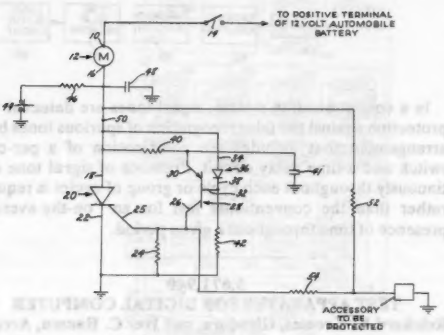
3,671,934
AUTOMOBILE THEFT ALARM FOR DETECTING UNAUTHORIZED ENERGIZATION OF RESISTIVE LOAD

Rudor M. Teich, 6040 Boulevard East, West New York, N.J.

Filed Nov. 2, 1970, Ser. No. 86,222
Int. Cl. B60r 25/10
U.S. Cl. 340—63 15 Claims

This invention relates to a method and device for detecting and indicating the unauthorized entry into an automobile, the unauthorized use of an automobile, and/or the unauthorized removal of an accessory of an automobile. In this invention, a

voltage sensing device designed to operate only when the rate-of-change of a potential being sensed is greater than a predetermined value such as would occur when a resistive load is connected across the terminals of a battery. The rate-of-change voltage sensing device is coupled to monitor the voltage from the battery of a car. The rate-of-change voltage sensing device is not sensitive to and does not indicate the



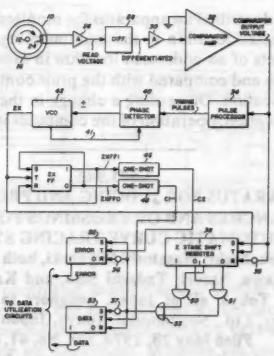
mere physical phenomena of a reduction in the battery terminal voltage. An inductive load such as motor or a coil, while it does result in a drop of battery terminal voltage, does not produce a pulse signal having a substantial rate-of-change and, therefore, will not initiate activation of the voltage sensing device. Thus, the voltage sensing device, when connected to a car battery, is selectively sensitive to the coupling of resistive loads to the battery, and insensitive to the operation of a normally operating accessory such as an electric clock.

3,671,935

METHOD AND APPARATUS FOR DETECTING BINARY DATA BY POLARITY COMPARISON

James P. Lipp, and William H. Jones, both of Oklahoma City, Okla., assignors to Honeywell Information Systems Inc.

Filed May 28, 1970, Ser. No. 41,493
Int. Cl. G08c 25/00
U.S. Cl. 340—146.1 AB **2 Claims**



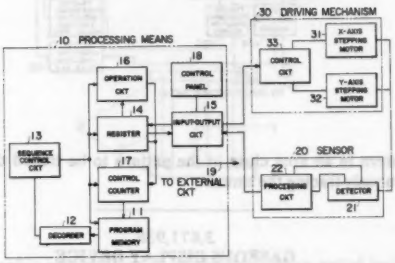
An apparatus and a method is disclosed in which binary data is retrieved from a medium on which data is stored. A read signal representative of the binary data is derived, differentiated, and sampled to obtain two sample signals representative of the polarity of the differentiated read signal. The two sample signals are compared to obtain the binary value of the data.

3,671,936

DISCONTINUITY PROCESSING APPARATUS FOR AUTOMATIC CURVE TRACING SYSTEM

Tadashi Takahashi; Masatoshi Miyazaki, both of Sendai; Yasuhiko Ogawa, Natori; Tadashi Sato, and Kazuhiko Kakuta, both of Tokyo, all of Japan, assignors to Iwatsu Electric Company Ltd.

Filed May 28, 1970, Ser. No. 41,296
Claims priority, application Japan, May 31, 1969, 44/42077
Int. Cl. G06k 9/16
U.S. Cl. 340—146.3 AE **2 Claims**



In an automatic curve tracing system comprising a detector for performing a round scanning operation along the periphery of an area containing a curve to be traced to provide an information regarding the presence or absence and the position of the curve, means responsive to the information to move the detector in a predetermined direction and over a predetermined distance to trace the curve and means for repeating above described tracing operation, there is provided a discontinuity processing apparatus comprising means to broaden the scanning area of the detector, means to determine the number of informations generated by the detector when it performs the round scanning operation, means responsive to the number of informations corresponding to a discontinuity of the curve and means to broaden the scanning area of the detector when it reaches the discontinuity to judge the presence or absence of another curve to be traced.

3,671,937

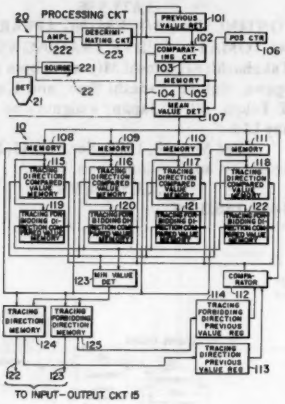
AUTOMATIC PATTERN TRACING SYSTEMS

Tadashi Takahashi; Masatoshi Miyazaki, both of Sendai; Yasuhiko Ogawa, Natori; Tadashi Sato, and Kazuhiko Kakuta, both of Tokyo, all of Japan, assignors to Iwatsu Electric Company, Ltd., Suginamiku, Tokyo, Japan

Filed May 28, 1970, Ser. No. 41,297
Claims priority, application Japan, May 31, 1969, 44/42071; May 31, 1969, 44/42072
Int. Cl. G06k 9/16
U.S. Cl. 340—146.3 AE **2 Claims**

An automatic system for tracing a pattern depicted on a sheet of drawing comprises a detector operative to determine the presence or absence of the pattern to convert it into an electric signal, tracing direction detecting means responsive to the electric signal to judge whether the pattern is to be traced or not so as to provide a signal for moving the detector in the tracing direction, a driving mechanism responsive to the signal from the tracing direction detecting means to relatively move the detector in a predetermined direction by a predetermined distance and means to generate a digital signal corresponding

to the tracing direction or a tracing spot, said detector detecting the information regarding the presence or absence of the



pattern in an area close to the pattern to be traced thus continuously tracing the same.

3,671,938

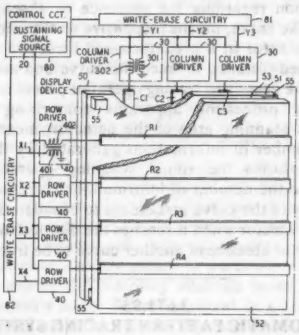
GASEOUS DISPLAY DEVICE

Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed May 2, 1969, Ser. No. 821,410

Int. Cl. H05b *37/00*; H01j *17/00*

U.S. Cl. 340—166 R **12 Claims**



An improved plasma display device in which the cellular or perforated middle layer of gas-filled holes is replaced with a substantially uniform continuous layer of gas, thereby simplifying manufacture and assembly of the device.

The display driving circuitry includes individual row and column pulse transformers having their secondary windings connected to a common alternating polarity sustaining signal source and having their primary windings connected to respective address signal input leads. An address signal on a selected row lead and column lead initiates discharge breakdown of the gas at the row-column intersection. The sustaining signal thereafter operates in conjunction with charge stored at the intersection by the initial breakdown to periodically break down the gas at the intersection. Initial breakdown is effected advantageously during a different interval than the interval in which periodic breakdown occurs at other intersections.

3,671,939

PER-CYCLE BASIS FREQUENCY SIGNAL RECEIVER

David Carlaw Trimble, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 15, 1970, Ser. No. 81,005

Int. Cl. H04q *1/44*

U.S. Cl. 340—171 **7 Claims**

In a communication system, signal tones are detected with protection against the false recognition of spurious tones by an arrangement that includes the combination of a per-cycle switch and a time delay circuit. Presence of signal tone continuously throughout each cycle or group of cycles is required rather than the conventional test for an "on-the-average" presence of tone throughout a given period.

3,671,940

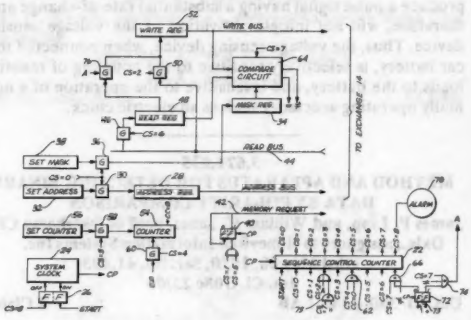
TEST APPARATUS FOR DIGITAL COMPUTER

Reinhard K. Kronies, Glendora, and Iver C. Hansen, Arcadia, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed March 19, 1970, Ser. No. 21,044

Int. Cl. G06f *11/00*

U.S. Cl. 340—172.5 **6 Claims**



There is described an apparatus for monitoring the contents of any selected location in the main memory of a computer. The contents of an addressed location in memory is read out periodically and compared with the prior contents of the same memory location. On sensing a change in the contents of the memory location, operation of the computer is halted.

3,671,941

APPARATUS FOR JUDGING AND PROCESSING BRANCHES AND OR CROSSINGS FOR USE IN AUTOMATIC CURVE TRACING SYSTEM

Tadashi Takahashi; Masatoshi Miyazaki, both of Sendai; Yasuhiko Ogawa, Natori; Tadashi Sato, and Kazuhiko Kakuta, both of Tokyo, all of Japan, assignors to Iwatsu Electric Company, Ltd., Suginamiku, Tokyo, Japan

Filed May 28, 1970, Ser. No. 41,172

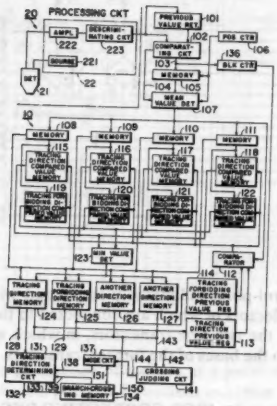
Claims priority, application Japan, May 31, 1969, 44/42073; May 31, 1969, 44/42074; May 31, 1969, 44/42075; May 31, 1969, 44/42076

Int. Cl. G06k *11/02*

U.S. Cl. 340—172.5 **7 Claims**

In an automatic curve tracing system wherein an area containing a curve to be traced is scanned by a detector and the detector is moved successively according to a positional infor-

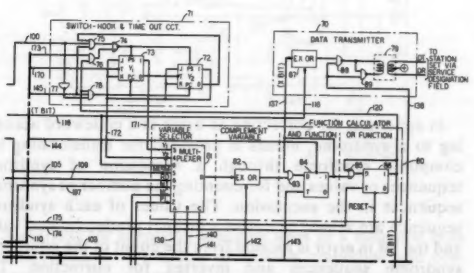
mation obtained by the scanning operation, there is provided apparatus for judging a branch and or crossing including means to judge whether the branch and or crossing are included or not in the scanning area and means to store the result of the judgement while the same branch and or crossing are contained in the subsequent scanning area.



3,671,942
A CALCULATOR FOR A MULTIPROCESSOR SYSTEM

Dieter John Henry Knollman, Guttenberg, N.J., and James Louis Simon, Denver, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 5, 1970, Ser. No. 43,812
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **5 Claims**

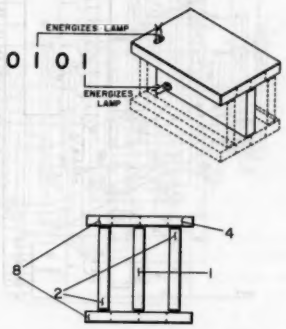


A program controlled multiprocessor system is disclosed. The system includes line modules and station modules which respectively provide the interface circuitry between PBX/CO lines and station set equipment. Modules are connected to a multi-phase clock which generates a reiterative list of binary coded instruction signals for directing circuit operations. Each of the modules acts simultaneously on receipt of the instruction signals to generate independently and dynamically separate work programs for each module. In addition, inter-module signals are exchanged during various subroutines in the program as directed by the simultaneously received instruction signals at each module.

3,671,943
NUMBERS SYMBOLOGY

Harold W. Thompson, Pasadena; Harry W. Smith, West Covina, and Paul A. McCann, Jr., Temple City, all of Calif., assignors to said Thompson, by said Smith and McCann

Continuation-in-part of Ser. No. 680,544, Nov. 3, 1967, abandoned. This application Aug. 31, 1970, Ser. No. 68,236
Int. Cl. G06f *5/00*
U.S. Cl. 340—172.5 **11 Claims**

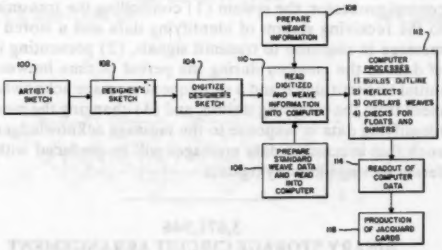


A graphic presentation of numbers in binary coded basimal form in such fashion that the binary encoding of each basimal digit forms a distinctive symbol easily recognizable to the human being as a number. It is also easily entered into a register by automatic means.

3,671,944
METHOD AND APPARATUS FOR PRODUCING JACQUARD CARDS

Harvey Dubner, Ridgewood, N.J., assignor to The Baxter Corporation

Filed Jan. 31, 1969, Ser. No. 795,657
Int. Cl. D03d *149/00*; G06d *17/00*
U.S. Cl. 340—172.5 **12 Claims**

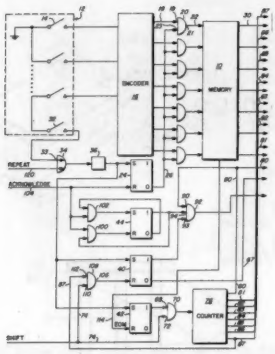


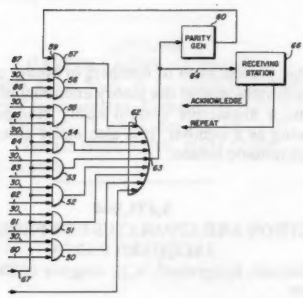
A method and apparatus for producing Jacquard cards in which the pattern of the artist's sketch is digitized into numerical coordinates corresponding to pattern change on a pick by pick basis and a data carrying medium having this coordinate information thereon is produced. The data carrying medium is supplied to a computer which builds an outline of the pattern in its memory and overlays the outline with the appropriate weaves which are also stored in the computer memory. The finished pattern with overlaid weaves is read out of computer memory in a data format which can be readily converted into the finished Jacquard cards.

3,671,945
DATA MESSAGE CONTROL SYSTEM

Anthony F. Maggio, Jr., Oklahoma City, Okla., assignor to Honeywell Information Systems Inc.

Filed Sept. 2, 1970, Ser. No. 68,868
Int. Cl. G08c 25/02
U.S. Cl. 340—172.5 14 Claims





A system for controlling the transmission of data messages from a data handling device having a memory and data input apparatus such as a keyboard to a receiving station such as a central processor, the system (1) controlling the transmission to the receiving station of identifying data and a stored data message in response to transmit signals, (2) preventing input of data to the memory during the period of time between an initial transmit signal and a subsequent message acknowledgement from the receiving station, and (3) changing the message identifying data in response to the message acknowledgement such that successive data messages will be prefaced with different message identifying data.

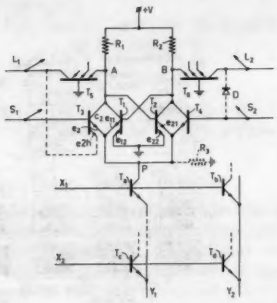
3,671,946
BINARY STORAGE CIRCUIT ARRANGEMENT

Einar Andreas Aagaard, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1970, Ser. No. 34,165
Claims priority, application Netherlands, May 29, 1969, 6908154
Int. Cl. G11c 11/40; H03k 3/286
U.S. Cl. 340—173 FF 8 Claims

The invention relates to a bistable trigger circuit comprising two transistors and associated with a group of trigger circuits which may be not only in two binary information states in which one transistor is conducting and the other is cut off, but also in a rest position of low dissipation or in a state of higher dissipation for writing or reading information.

According to the invention the trigger circuits can be passed individually into the state of higher dissipation by means of two further transistors, the emitters of which are connected to

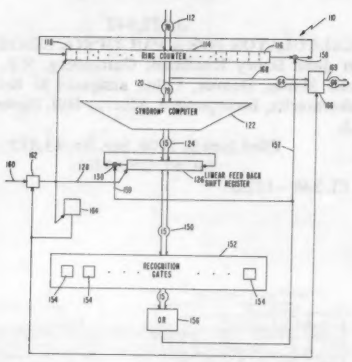


a control-point individually associated with the triggers and the collectors of which are connected to the respective collectors of the two first transistors, in which write signals are applied to the bases of the further transistors.

3,671,947
ERROR CORRECTING DECODER

Douglas C. Bossen, Wappingers Falls, and Mu-Yue Hsiao, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 28, 1970, Ser. No. 75,823
Int. Cl. G08c 25/00; G06f 11/12
U.S. Cl. 340—146.1 AL 10 Claims



In apparatus for correcting an error in a codeword according to a syndrome, means is provided for transforming the computed syndrome through a succession of syndrome sequences or values and for counting the number of syndrome sequences in the succession. The values of each syndrome sequence are sensed to detect a distinct predetermined value and the bit in error is located from the count of the number of syndrome sequences and inverted for correction. The preferred embodiment uses a shortened Bose-Chaudhuri codeword and uses a linear feedback shift register to transform the syndrome values.

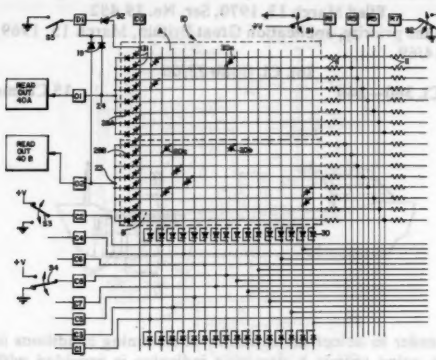
3,671,948
READ-ONLY MEMORY

Quentin C. Cassen, Tustin; James A. Luist, Anaheim, and Naif D. Salman, Orange, all of Calif., assignors to North American Rockwell Corporation

Continuation of Ser. No. 744,719, Nov. 12, 1968. This application Sept. 25, 1970, Ser. No. 75,739
Int. Cl. G11c 17/00, 11/36
U.S. Cl. 340—173 SP 6 Claims

A microminiature diode array is formed as a high density

matrix with at least one diode electrically connecting or not connecting a row of said matrix to a column of said matrix to provide upon electrical interrogation a two-state signal indica-



tive of the presence or absence of a diode at a particular row and column, and wherein parallel-coincident selection of rows and columns occurs with a sensing means provided for each independent sub-array of the matrix.

3,671,949

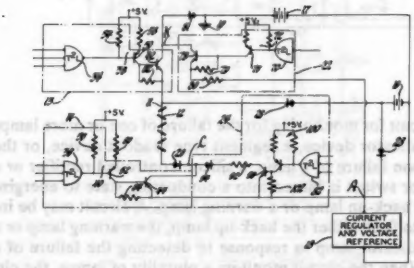
METHOD AND APPARATUS FOR DRIVING MEMORY CORE SELECTION LINES

William E. McLean, Hales Corners, and David E. Ruch, Goleta, both of Calif., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 713,638, March 18, 1968, Pat. No. 3,544,978. This application April 27, 1970, Ser. No. 32,082

Int. Cl. G11c *11/06, 5/02*

U.S. Cl. 340—174 TB **2 Claims**



Apparatus for supplying selection lines of a magnetic core memory with drive currents of uniform amplitude and configuration. The apparatus includes a pair of line selection switches at opposite ends of a selection line group for steering current from a source through a selected line and a current regulator that maintains the sum of the currents through the line at a constant level. The lines in the group are terminated by a set of alternately operable termination circuits, which set is common to all of the lines of a coordinate axis of the memory array. The termination circuit serve to damp voltage spikes, ringing oscillations and the inductive energy of the line upon energization and de-energization thereof and to maintain the lines of the memory stack at a fixed potential to prevent the lines from floating due to leakage currents and capacitive voltage build-ups that would establish the lines at different potentials during inactive or memory idle periods.

3,671,950

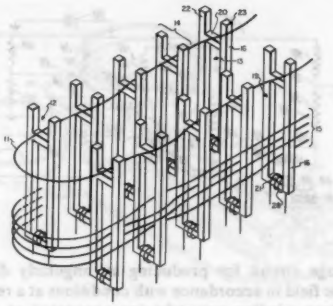
READILY ALTERABLE WOVEN-WIRE MAGNETIC MEMORY UNIT

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 3, 1970, Ser. No. 94,710

Int. Cl. G11c *5/04, 17/00*

U.S. Cl. 340—174 SP **4 Claims**



Woven-wire, transformer memories that are to be occasionally altered by adding conductors to their braid, have an end of each of the legs of their cores extended past a usual U-shaped portion. The end that is extended is readily moved outward momentarily in opposition to a mounting spring to form between the leg and the rest of the core a gap that is wide enough to permit passage of additional conductors for storing information. The conductors to be added are first braided on the extended portions of the legs, and their coding positions are checked before the memory is interrupted only long enough to move the added conductors a short distance along the legs through the gaps.

3,671,951

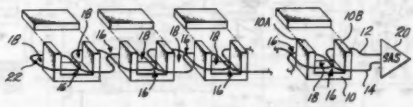
SENSE LINE COUPLING STRUCTURES AND CIRCUITS FOR MAGNETIC MEMORY DEVICES

Shi K. Lee, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 15, 1969, Ser. No. 885,227

Int. Cl. G11c *17/00*

U.S. Cl. 340—174 SP **18 Claims**

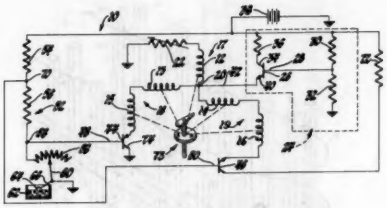


Sense line and sense amplifier configurations and circuits for coupling to magnetic memory elements. A sense line comprising a twisted pair of conductors provides coupling along its length to the memory elements. A pair of sense lines may be connected in series or parallel to provide sense signal output pulses of increased amplitude or provide redundancy in the sensing scheme. Further permutations and combinations of the twisted pair sense line provide sense signal output pulses of different amplitude to also provide, e.g., half select pulses. A sense amplifier system utilizes multiplexing techniques to simplify the sense scheme and reduce the amount of circuitry required between the sense lines and the buffer system.

3,671,952
APPARATUS FOR GENERATING AN ANGULARLY DISPLACEABLE MAGNETIC FIELD

Harold J. Simms, Jr., Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1970, Ser. No. 87,846
Int. Cl. G08c 19/04
U.S. Cl. 340—177 12 Claims

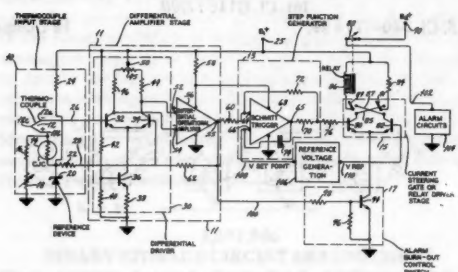


A gauge circuit for producing an angularly displaceable magnetic field in accordance with conditions at a remote location. Three winding networks are connected at a common junction that is held at a predetermined voltage by a voltage regulator. One winding network generates a constant magnetic field while the other winding networks generate variable magnetic fields in accordance with their energization, which is controlled by transistors that are series connected with each of the other winding networks and are responsive to a voltage signal that is generated in accordance with the conditions at a remote location. The magnetic field generated by the winding networks combine to form the angularly displaceable resultant magnetic field oriented in accordance with the conditions being monitored.

3,671,953
HIGH, LOW AND THERMOCOUPLE BURN-OUT ALARM SYSTEM

Jack Goldberg, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed July 2, 1970, Ser. No. 51,877
Int. Cl. G08b 17/06
U.S. Cl. 340—227 R 8 Claims

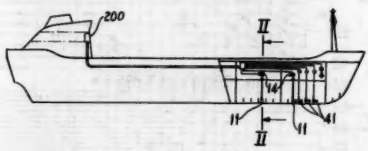


An alarm annunciator having hot, cold and thermocouple burn-out capability without requiring specific resistor connections for the hot and cold alarm modes of operation. An alarm burn-out switch responds to certain voltage variations in the annunciator signal translating circuitry during alarm thermocouple burn-out to provide electrical control of an alarm indicating means. The burn-out switch also serves as a constant current sink during both the hot and cold alarm modes of operation.

3,671,954
SLAMMING INDICATOR SYSTEM FOR MARINE DEVICES

John Armstrong Clay, Bowdon, England, assignor to Manchester Liners Limited, Port of Manchester, England

Filed March 13, 1970, Ser. No. 19,452
Claims priority, application Great Britain, March 15, 1969, 13,714/69
Int. Cl. G08b 23/00
U.S. Cl. 340—240 15 Claims

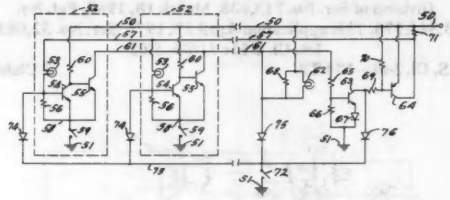


In order to detect the existence of slamming conditions in ocean going vessels a slamming indicator is provided with monitors the water pressure beneath the forefoot of the vessel and which energizes an indicator according to such pressure.

3,671,955
LAMP FAILURE DETECTION CIRCUIT

Ali Asghar Malekzadeh, Costa Mesa, Calif., assignor to Master Specialties Company, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 840,174, July 9, 1969, abandoned. This application March 30, 1970, Ser. No. 23,936
Int. Cl. G08b 5/22
U.S. Cl. 340—251 4 Claims



A circuit for monitoring for the failure of one or more lamps in an indicator device, a segment type readout device, or the like. Upon failure of a lamp, a silicon controlled rectifier or a transistor switch is biased into a conducting state to energize either a back-up lamp or a warning lamp. A circuit may be included to flash either the back-up lamp, the warning lamp or a third indicator lamp in response to detecting the failure of a lamp. When the circuit monitors a plurality of lamps, the circuit can be adapted to deactivate all lamps upon detecting the failure of any of the lamps.

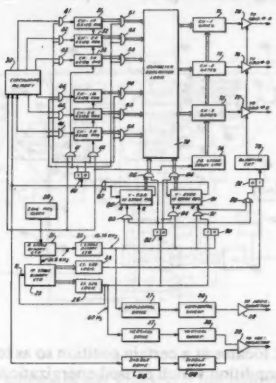
3,671,956
DISPLAY SYSTEM

Thomas D. Kegelman, Ridgefield, and Peter R. Williams, Wilton, both of Conn., assignors to Computer Optics, Inc., Bethel, Conn.

Filed March 12, 1969, Ser. No. 806,624
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 22 Claims

A multiple beam alpha-numeric display system wherein a plurality of text lines are formed simultaneously with the top segments of the characters in a text line being formed on a first pass and successively lower segments being formed in subsequent passes. A non linear vertical sweep is used to compress the interline spacing of horizontal traces within a text

line and to increase the interline spacing between text lines. To minimize display distortion, the multiple electron beams



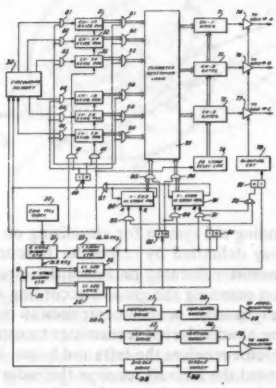
are oriented to cross one another at the center of the deflection yokes.

3,671,957

CHARACTER GENERATION DISPLAY SYSTEM

Thomas D. Kegelman, Ridgefield, and Peter R. Williams, Wilton, both of Conn., assignors to Computer Optics, Inc., Bethel, Conn.

Filed March 12, 1969, Ser. No. 806,455
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A 8 Claims



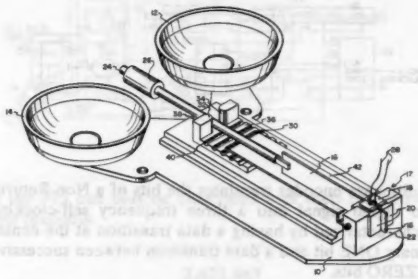
Character generation circuitry for an alpha-numeric cathode ray tube display wherein successive characters appear in successive character slots of a plurality of text lines, the top segments of the characters being formed on a first pass and successively lower segments being formed in subsequent passes. The system includes delay line circuitry for providing pulses corresponding in time to a plurality of horizontal increments for each horizontal trace passing through a character slot, the delay line circuitry working in combination with logic which designate selected ones of the horizontal increments according to designations of the horizontal trace and character then being formed. The logic circuits are so arranged that the same logic is used in forming similar character portions where they appear in different characters.

3,671,958

PIEZOELECTRIC SIGNALING DEVICE

Frederick Storz, Englishtown, N.J., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed April 29, 1971, Ser. No. 138,541
Int. Cl. G10k *1/063*
U.S. Cl. 340—392 7 Claims



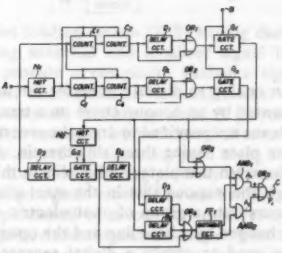
A gong-type signaling device having a pair of metal gongs, a clapper affixed to a clapper shaft which is in turn affixed to an elongate piezoelectric element activated by the application of an a.c. voltage. The device is provided with an adjustable loudness control including a pair of upright members, one disposed on each side of the clapper shaft and movable along the longitudinal axis thereof to restrict the velocity with which the clapper strikes the metal gongs to a preselected level thereby controlling the loudness of the signaling device.

3,671,959

BINARY TO TERNARY CONVERTER

Kitsutaro Amano, Yokohama-shi, Japan, assignor to Kokusai Denshin Denwa Kebushiki Kaisha, Tokyo-to, Japan

Filed Jan. 20, 1970, Ser. No. 4,217
Claims priority, application Japan, Jan. 24, 1969, 44/5135; March 24, 1969, 44/21696
Int. Cl. H04l *3/00*
U.S. Cl. 340—347 DD 3 Claims

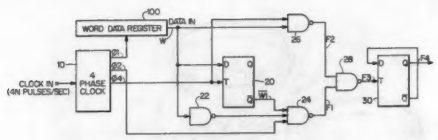


A system for converting two binary pulse trains to a ternary pulse train in which the states of signal elements of a pulse train of bipolar code corresponding to a first binary information train are modified in accordance with the states of signal elements of a second binary information train so as to be against the rule of alternation of polarities "+" and "−" of the bipolar code if at least two signal elements of the pulse train of bipolar code have the same state "1" or "0." The above-mentioned modification is performed, except for the first signal element of the same state "1" or "0," for each signal element or for each pair of adjacent two signal elements.

3,671,960
FOUR PHASE ENCODER SYSTEM FOR THREE FREQUENCY MODULATION

George H. Sollman, Cambridge, and Samuel J. Dixon, Holliston, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed July 6, 1970, Ser. No. 52,313
Int. Cl. H04l 3/00
U.S. Cl. 340—347 DD 18 Claims

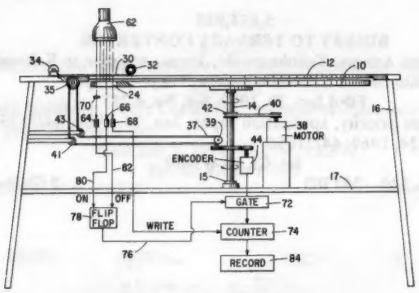


A multiphase encoder translates the bits of a Non-Return-to-Zero digital signal into a three frequency self-clocking signal characterized by having a data transition at the center of a binary ONE bit and a data transition between successive binary ZERO bits.

3,671,961
ANALOG TO DIGITAL CONVERTER FOR WELL LOGS

Ralph H. Lindley, and Richard E. Bickham, both of Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla. and Petroleum Information Corporation, Denver, Colo., part interest to each

Filed April 28, 1969, Ser. No. 819,872
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD 3 Claims



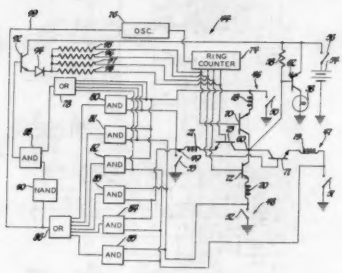
This is an analog to digital converter for use with analog data represented by an opaque curve on a translucent record medium. Means are provided to drive the record medium over an enclosure plate having three slits therein. A rotating disc rotates underneath this plate. Radial slits in this disc let light pass through the various slits in the steel plate when coincidence occurs onto a group of photoelectric cells. The light passage is changed by a base line and the opaque curve; such changes are used to obtain a digital representation of the curve at that point.

3,671,962
MULTIPLE INDICATING TELLTALES HAVING SEQUENTIAL INDICATIONS

Douglas I. Fales, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1970, Ser. No. 91,393
Int. Cl. G08b 5/24, 5/30
U.S. Cl. 340—373 4 Claims

Apparatus for providing information as to a plurality of conditions using a single air core gauge. Each condition being monitored controls a switch that in turn controls the energization of at least one winding, the magnetic fields generated by the windings forming a resultant magnetic field that controls the orientation of an indicia-bearing rotatable disc. When one or more windings are energized a lamp illuminates the indicia

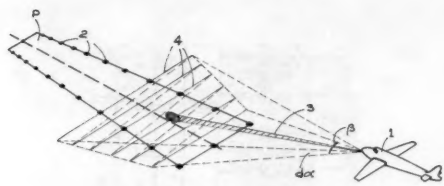


which the disc locates at a certain position so as to indicate the status of the condition which caused energization of the winding. A provision is also made to index the disc between a plurality of positions so as to advise of several conditions which may require attention at the same time.

3,671,963
BLIND LANDING AIDS

George Assouline; Pierre Conjeaud; Pierre Girault, and Eugene Leiba, all of Paris, France, assignors to Thomson-CSF

Filed Dec. 19, 1969, Ser. No. 886,481
Claims priority, application France, Jan. 3, 1969, 6900025
Int. Cl. G01s 9/62
U.S. Cl. 343—6 ND 5 Claims



A blind landing aid system for visualizing on board an aircraft, a runway delimited by responder beacons wherein an infra-red transmitter, located on board the aircraft, emits an infra-red beam scanning the ground according to a television pattern, each responder beacon comprises an infra-red detector controlling a radioelectric transmitter transmitting a pulse when the detector receives the infra-red beam, and a receiver, located on board the aircraft receives the radioelectric pulses and controls the electron beam of a cathode-ray tube whose screen is scanned in synchronism with the scanning of the infra-red beam.

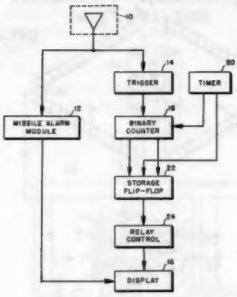
3,671,964
AUTOMATIC RADAR DETECTION DEVICE

Andrew J. Trochanowski, La Mesa, and Steven A. Wicks, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 30, 1970, Ser. No. 85,590
Int. Cl. H04k 3/00; G01s
U.S. Cl. 343—18 E 4 Claims

A shipborne detector for indicating the presence or absence of "search-lighting" or continuous observation by hostile pulsed tracking radars wherein presence is indicated if the

pulse rate of incoming radar pulses exceeds a selectively predetermined rate whereby a radar display is automatically activated and automatically blanked if the pulse rate does not exceed the predetermined rate.

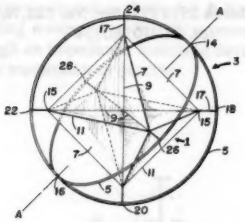


3,671,965

RAPID DEPLOYMENT CORNER REFLECTOR

David W. Rabenhorst, Silver Spring, and Kenneth E. Darnell, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 3, 1970, Ser. No. 25,483
Int. Cl. H01q *1/28, 15/20*
U.S. Cl. 343—18 C 1 Claim



A readily deployable, lightweight radar reflector having a large radar signature, the invention is compactly stowable aboard a carrier vehicle, immediately assuming an erect configuration on ejection from an airborne or surface vehicle. The present reflector is particularly intended to be ejected from aircraft traveling at high speeds, the erection of the reflecting surface being provided by the internal bias of pre-stressed hoops surrounding and supporting the reflecting surface.

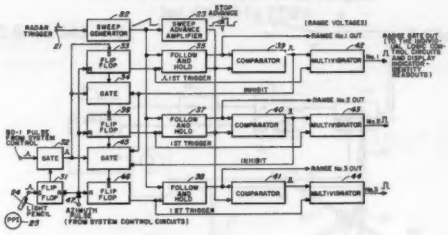
3,671,966

MULTIPLE TARGET SEPARATOR

Frederick R. Fluhr, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 27, 1970, Ser. No. 67,328
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 R 7 Claims

A system for separating and identifying multiple targets within a PPI positioned gate area on a Radar IFF display. The IFF target separator acts upon the IFF response times within the gate and separates the targets in range order regardless of the order of arrival times of the target responses. The targets



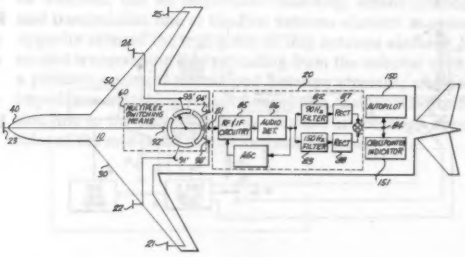
on the PPI can thus be associated with their respective IFF code readouts.

3,671,967

MULTIPLE ANTENNA INSTRUMENT LANDING SYSTEM

James R. Fries, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 11, 1970, Ser. No. 36,223
Int. Cl. G01s *1/16*
U.S. Cl. 343—108 R 13 Claims



An instrument landing system (ILS) having distributed localizer receiving antennas and localizer signal information processing to provide a composite guidance signal having reduced localizer beam noise for reduced lateral touchdown dispersion in automatic landing systems. A plurality of conventional localizer antennas are positioned at several laterally displaced points across the approach path along the wings of an aircraft and the corresponding plurality of received localizer beam deviation signals received by each of these antennas is individually processed by a localizer receiver system with the audio course deviation signals developed from the several antennas being averaged to provide the composite guidance signal for use in autopilot or crosspointer indicator.

3,671,968

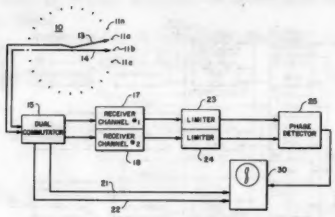
TWO CHANNEL DIRECTION FINDER

John M. Beukers, and Christian B. Williams, both of Stony Brook, N.Y., assignors to The United States of America as represented by the Secretary of the Army

Filed Jan. 26, 1970, Ser. No. 5,455
Int. Cl. G01s *3/54*
U.S. Cl. 343—113 DE 2 Claims

A direction finder including two receiving channels commu-

tatively connected to different closely spaced antennas of a receiving antenna array such that the phase difference between the two receiving antennas is always kept below a half wavelength at the highest operating frequency.



3,671,969

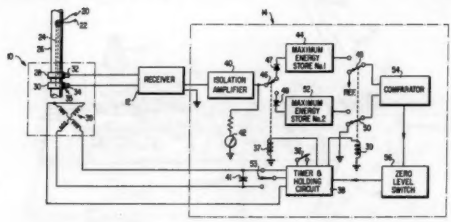
AUTOMATIC ANTENNA ALIGNMENT SYSTEM FOR ENABLING MAXIMUM SIGNAL RECEPTION

Vefik A. Basman, 7290 Fosdick Road, Saline, Mich.

Filed Jan. 30, 1970, Ser. No. 7,290

Int. Cl. G01s 3/44

U.S. Cl. 343—117 R **4 Claims**



An automatic antenna alignment system for enabling maximum signal reception includes a storage circuit for storing the maximum energy developed by a receiver as a directional antenna is rotated through a first revolution and a comparator for comparing the signal stored during the first revolution with the signal developed by the receiver during a second antenna revolution such that when maximum signal reception occurs during the second revolution, the output of the comparator will trigger a switch and thereby stop the antenna in the direction of optimum alignment for maximum signal reception.

3,671,970

SWITCHED RHOMBIC AUTOMATIC DIRECTION FINDING ANTENNA SYSTEM AND APPARATUS

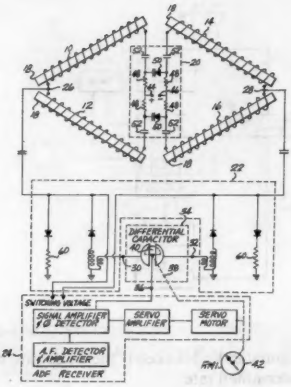
John E. Layton, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 31, 1970, Ser. No. 68,300

Int. Cl. C01s 5/04

U.S. Cl. 343—120 **8 Claims**

An antenna system which includes a four-element structure composed of inductances wound on high Q ferrite material and arranged in the form of a rhombus in combination with switching and tuning circuits provides both the bi-phase and constant phase signals required for automatic direction finding (ADF) equipment, thus eliminating the sense antenna requirement in these systems.



3,671,971

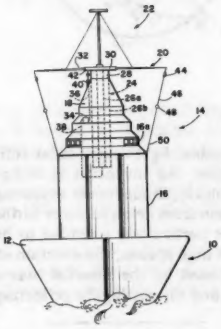
HF SUPERSTRUCTURE DISCONE ANTENNA

Richard L. Goodbody, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 29, 1971, Ser. No. 128,787

Int. Cl. H01q 1/34

U.S. Cl. 343—710 **4 Claims**

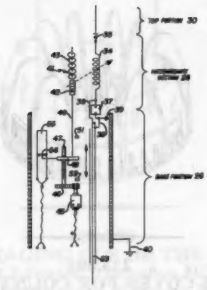


A superstructure discone HF antenna comprising a vertically oriented ship's superstructure and a discone antenna connected to and rigidly supported and mounted upon the top thereof to form a unitary radiating structure. By using a self-supporting superstructure as an integral component of the antenna, the number of possible HF parasitic radiators is reduced and limited topside space available on naval ships is more efficiently utilized.

3,671,972
ADJUSTABLE CENTER LOADED ANTENNA ARRANGEMENT

Ashton James Spilsbury, 6691 Madrona Crescent, West Vancouver, British Columbia, and Oswald Thorkelson, 3182 Tolmie Street, Vancouver, British Columbia, both of Canada

Filed Jan. 7, 1970, Ser. No. 1,141
Int. Cl. H01q 9/00
U.S. Cl. 343—750 9 Claims

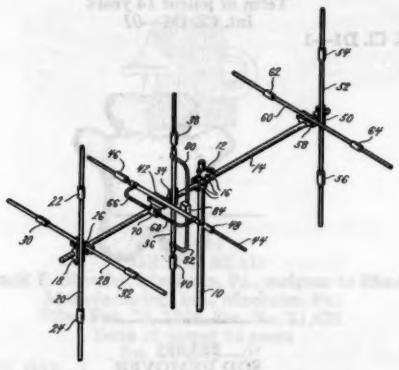


A center-loaded antenna arrangement having a fixed loading coil in a whip antenna, and a tuning core mounted for movement through and out of the coil, said core having a ferrous section and an inductor ring section. Suitable connecting means connects an end of the coil to a radio ground and to a radio transmitter or receiver through a R.F. transmission line. This connecting means is preferably connected to the radio ground through an impedance matching device which couples the coil to the transmitter or receiver.

3,671,973
SELECTIVELY POLARIZED ANTENNA EMPLOYING IMPEDANCE MATCHED CROSSED DIPOLES

Gerald H. French, St. Louis, Mo., assignor to Mosley Electronics Company, St. Louis, Mo.

Filed Oct. 24, 1969, Ser. No. 869,159
Int. Cl. H01q 21/26
U.S. Cl. 343—751 9 Claims

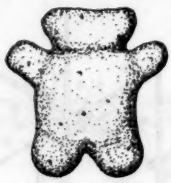


A selectively polarized antenna has an antenna element parallel to one axis, has a second antenna element parallel to an angularly displaced second axis, has a selector switch connected to the down lead, has a transmission line extending from the selector switch to a position adjacent the first antenna element, has an impedance-matching means connecting said transmission line to the first antenna element at points on opposite sides of the mid-point of that antenna element, has a second transmission line extending from the selector switch to a position adjacent the second antenna element, and has an impedance-matching means connecting the second transmission line to the second antenna element at points on opposite sides of the mid-point of that antenna element.

DESIGNS

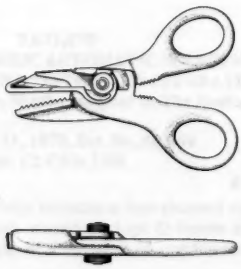
JUNE 20, 1972

223,891
EXPANDED CEREAL FOOD PRODUCT
Peter A. Cammelot, Streamwood, and Leroy F. Duvall, Barrington, Ill., assignors to The Quaker Oats Company
Filed Sept. 18, 1970, Ser. No. 25,069
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—1

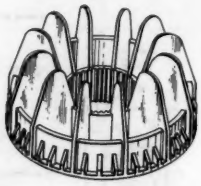


223,892
SOD REMOVER
Charles John Philip Smith, 274 Forest Road, Bexley, New South Wales, Australia
Filed Oct. 12, 1970, Ser. No. 25,427
Claims priority, application Australia Apr. 16, 1970
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—5

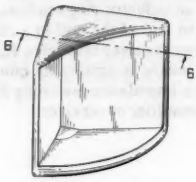
223,893
FLOWER SHEAR
Ronald David Carter, Leamington Spa, England, assignor to The Stanley Works, New Britain, Conn.
Filed Dec. 3, 1970, Ser. No. 26,275
Claims priority, application Great Britain Sept. 3, 1970
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—5



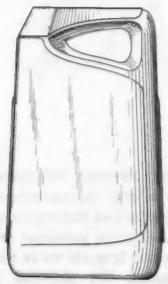
223,894
CORE FOR PAPER ROLLS
Dana B. Bates, Kirkland, Wash., assignor to Simpson Timber Company, Seattle, Wash.
Filed Apr. 30, 1970, Ser. No. 22,740
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—220



223,895
PROTECTIVE COVER FOR COUNTER CORNERS
Viola M. Berchert, 3360 Pittsview Drive, Ann Arbor, Mich. 48104
Filed Feb. 18, 1971, Ser. No. 116,731
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—263



223,896
JUG
John S. Frazer, Pequannock, N.J., assignor to Union Carbide Corporation, New York, N.Y.
Filed Jan. 20, 1971, Ser. No. 108,258
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—42



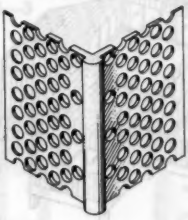
223,897
COMBINED GARMENT AND TRASH BAG
Robert T. Crew, 3871 Gadsden Road 32207, and Odean F. George, 6926 Cherbourg Ave. N. 32205, both of Jacksonville, Fla.
Filed July 6, 1970, Ser. No. 23,848
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—350

223,898
PACKAGING CUP OR THE LIKE
Bryant Edwards, Clarendon Hills, Ill. (8501 W. Higgins Road, Chicago, Ill. 60631)
Filed Mar. 12, 1970, Ser. No. 21,881
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

223,899
CAN OR THE LIKE
Arthur P. Zundel, Cary, Ill., assignor to National Can Corporation, Chicago, Ill.
Filed Jan. 8, 1970, Ser. No. 20,831
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—218

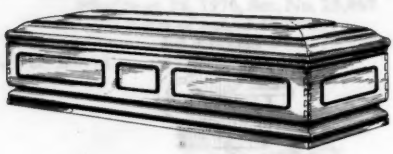
223,900
DISPENSING CLOSURE
Livingston C. Douglas, Leonia, N.J., and Gilbert De Wayne Miles, Ossening, and Russell Park McGhie, Somers, N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 7, 1971, Ser. No. 104,837
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—278

223,901
CORNER BEAD
Donald E. Shaeffer, Manheim, Pa., assignor to Rimar Manufacturing, Inc., Manheim, Pa.
Filed Feb. 25, 1970, Ser. No. 21,620
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1



223,902
DOOR
Raymond L. Kuniansky, Atlanta, Ga., assignor to Anaconda Aluminum Company
Filed Sept. 10, 1970, Ser. No. 24,914
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1

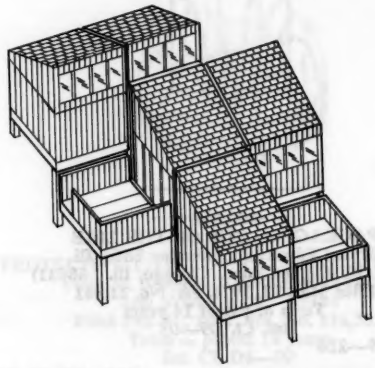
223,903
BURIAL CASKET
Fred Herricht, Bechtelsville, Pa., assignor to Boyertown Burial Casket Company, Boyertown, Pa.
Filed Oct. 21, 1970, Ser. No. 25,587
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D19—1



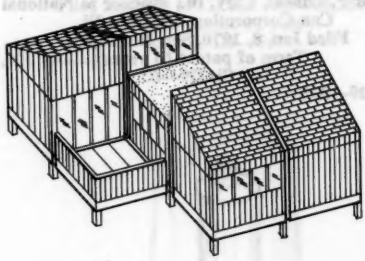
223,904
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, New York, N.Y.
(280 Vanderbilt Ave., Brooklyn, N.Y. 11205)
Filed Mar. 16, 1971, Ser. No. 125,016
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

223,905
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, New York, N.Y.
(280 Vanderbilt Ave., Brooklyn, N.Y. 11205)
Filed Mar. 16, 1971, Ser. No. 125,018
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

223,906
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, New York, N.Y.
(280 Vanderbilt Ave., Brooklyn, N.Y. 11205)
Filed Mar. 16, 1971, Ser. No. 125,017
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

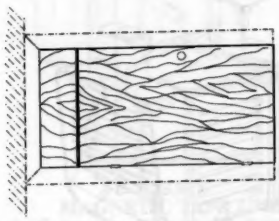


223,907
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, New York, N.Y.
(280 Vanderbilt Ave., Brooklyn, N.Y. 11205)
Filed Mar. 16, 1971, Ser. No. 125,019
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

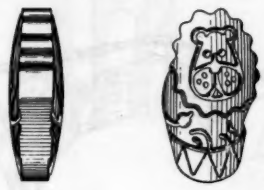


223,908
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, New York, N.Y. (280 Vanderbilt Ave., Brooklyn, N.Y. 11205)
Filed Mar. 16, 1971, Ser. No. 125,019
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

223,909
DOOR-TRANSOM ASSEMBLY
Frederick R. Ashby, Carmel, N.Y., and Leonard A. Ropella, Green Bay, Wis., assignors to U.S. Plywood-Champion Papers Inc.
Filed Aug. 16, 1968, Ser. No. 13,160
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1

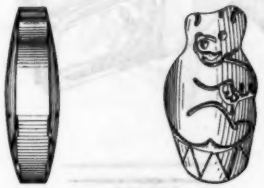


223,910
VITAMIN TABLET OR SIMILAR ARTICLE
Robert R. Wiethop, Evansville, Ind., assignor to Mead Johnson and Company, Evansville, Ind.
Filed Apr. 2, 1971, Ser. No. 130,862
Term of patent 14 years
Int. Cl. D28—*01;* D1—*02*
U.S. Cl. D16—3

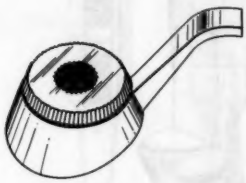


223,911
VITAMIN TABLET OR SIMILAR ARTICLE
Robert R. Wiethop, Evansville, Ind., assignor to Mead Johnson and Company, Evansville, Ind.
Filed Apr. 2, 1971, Ser. No. 130,864
Term of patent 14 years
Int. Cl. D28—*02;* D1—*02*
U.S. Cl. D16—3

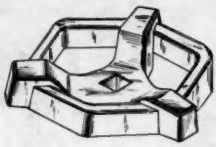
223,912
VITAMIN TABLET OR SIMILAR ARTICLE
Robert R. Wiethop, Evansville, Ind., assignor to Mead Johnson and Company, Evansville, Ind.
Filed Apr. 2, 1971, Ser. No. 130,865
Term of patent 14 years
Int. Cl. D28—*01;* D1—*02*
U.S. Cl. D16—3



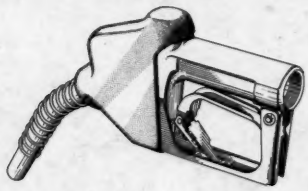
223,913
KITCHEN FAUCET HANDLE
James Edward Niemann, Louisville, Ky., assignor to American Standard, Inc., New York, N.Y.
Continuation-in-part of design application Ser. No. 20,160, Nov. 18, 1969. This application Nov. 2, 1970, Ser. No. 25,974
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29



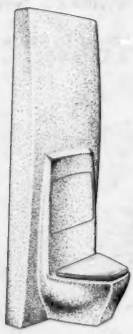
223,914
VALVE HANDLE
Masao Okano, Nagano-ken, Japan, assignor to Toyo Valve Company Limited, Tokyo, Japan
Filed Aug. 26, 1970, Ser. No. 24,694
Claims priority, application Japan May 4, 1970
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—30



223,915
COMBINED DISPENSING NOZZLE AND GUARD THEREFOR
George Z. Brown and William F. Babcock, Akron, Ohio, assignors to Dover Corporation, Cincinnati, Ohio
Filed Jan. 27, 1970, Ser. No. 21,108
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—37

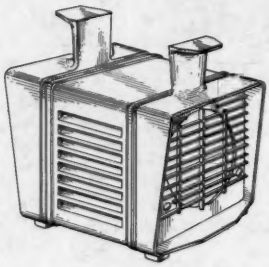


223,916
BATHROOM TOILET UNIT
Myron J. Ament, Bethel Park, Pa., assignor to Wallace-Murray Corporation, Pittsburgh, Pa.
Filed Sept. 25, 1970, Ser. No. 25,199
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49

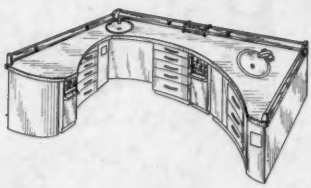


223,917
BATHROOM LAVATORY UNIT
Myron J. Ament, Bethel Park, Pa., assignor to Wallace-Murray Corporation, Pittsburgh, Pa.
Filed Sept. 25, 1970, Ser. No. 25,200
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49

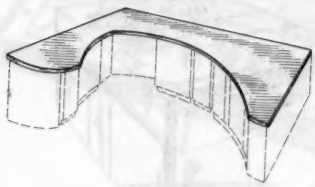
223,918
ELECTRIC HEATER HOUSING
Geoffrey T. Gray, Lambertville, Mich., assignor to Eprad Incorporated, Toledo, Ohio
Filed Jan. 15, 1971, Ser. No. 106,947
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—123



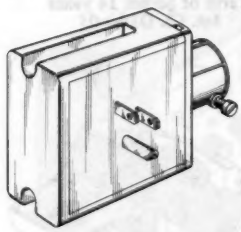
223,919
DENTAL CABINET OR THE LIKE
John J. Valeska, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed Oct. 21, 1970, Ser. No. 25,594
Term of patent 14 years
Int. Cl. D24—*03*; D6—*01*
U.S. Cl. D24—1



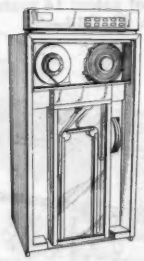
223,920
DENTAL CABINET COUNTER TOP
John J. Valeska, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed Oct. 21, 1970, Ser. No. 25,595
Term of patent 14 years
Int. Cl. D24—*03*; D6—*01*
U.S. Cl. D24—1



223,921
ELECTRICAL CONNECTOR
Milton Liberman, 65 Seawane Road, East Rockaway, N.Y. 11518
Filed Dec. 22, 1970, Ser. No. 26,619
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1

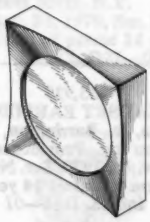


223,922
MAGNETIC TAPE UNIT
Thomas S. Kavanagh, Richard H. Ralston, Ronald R. Campbell, Jesse I. Aweida, and Regomar A. Thurmer, Boulder, Colo., assignors to Storage Technology Corporation, Boulder, Colo.
Filed July 8, 1970, Ser. N. 23,860
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

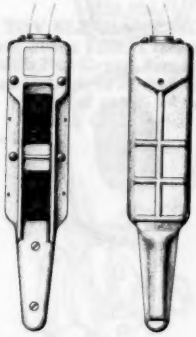


223,923
BATTERY
Keigo Momose, Moriguchi, Koji Ishihara, Hirakata, and Yoshimi Motonaka, Moriguchi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 14, 1970, Ser. No. 24,958
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—6

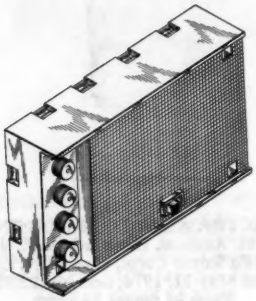
223,924
ELECTRICAL SWITCH HOUSING
Alexander M. Adelson, Elmsford, N.Y., assignor to Wild Rover Corp., Closter, N.Y.
Filed May 21, 1970, Ser. No. 23,093
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



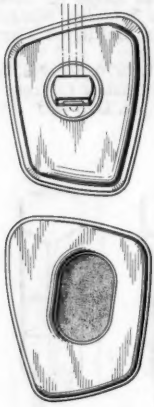
223,925
PENDANT HOIST CONTROL
Harold V. Hawkins and Ralph A. Dick, Williamsville, N.Y., and Edgar A. Bongort, Southfield, Mich., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.
Filed Aug. 21, 1970, Ser. No. 24,628
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



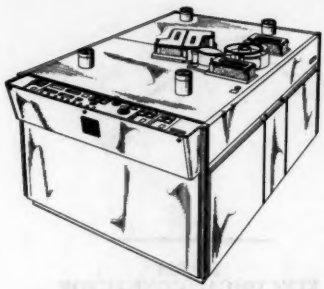
223,926
MASTER CONTROL PANEL FOR ALARM SYSTEMS OR THE LIKE
Robert D. Kahn, Rockville Centre, N.Y., assignor to Fedtro, Inc., Rockville Centre, N.Y.
Filed Jan. 22, 1971, Ser. No. 109,094
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



223,927
HEADSET EARPIECE
George T. Patton, Jr., Barrington, R.I., assignor to Textron Inc., Providence, R.I.
Filed Nov. 23, 1970, Ser. No. 26,125
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

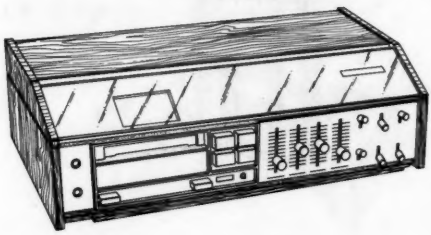


223,928
MAGNETIC TAPE DUPLICATOR
Darrel A. Lauer, San Mateo, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Mar. 29, 1971, Ser. No. 129,298
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



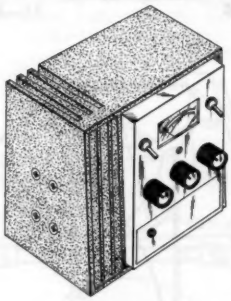
223,929
TELEPHONE INSTRUMENT
Ronald Binks, Chambersburg, Pa., assignor to Global Systems Design Corporation, Chambersburg, Pa.
Filed Apr. 1, 1971, Ser. No. 130,566
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

223,930
MAGNETIC TAPE CASSETTE TRANSPORT
Hari K. Matsuda, Evanston, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed June 3, 1971, Ser. No. 149,881
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

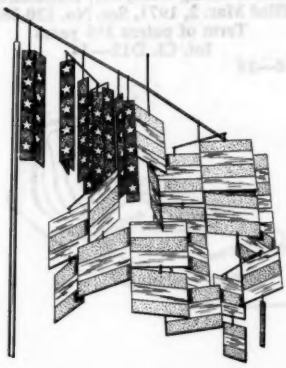


223,931
MAGNETIC TAPE CASSETTE TRANSPORT
Hari K. Matsuda, Evanston, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed June 3, 1971, Ser. No. 149,882
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

223,932
POWER SUPPLY
Maurice G. Paulson, Huntington, Thomas Kelleher, Farmingdale, Marvin L. Price, Queens, and Monte L. Levin, New York, N.Y., assignors to Lambda Electronics Corporation, Huntington, N.Y.
Filed Mar. 8, 1971, Ser. No. 122,287
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15



223,933
MOBILE
Leonard G. Lorch, 470 Roosevelt Ave., Freeport, N.Y. 11520
Filed Jan. 2, 1970, Ser. No. 20,753
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D29—1

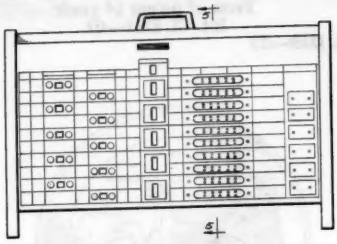


223,934
PLAQUE
Ruppert N. Kohlmaier, Jr., and Joy Wille Kohlmaier, both of 1020 W. William David Parkway, Metairie, La. 70005
Original design application May 22, 1970, Ser. No. 23,098. Divided and this application May 18, 1971, Ser. No. 144,706
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23

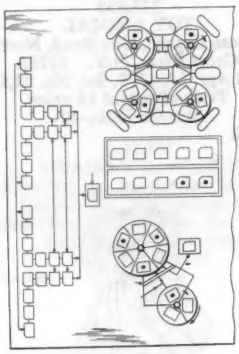
223,935
TOY ANIMAL
Terese Caputo, Otis Road, North Great River, N.Y. 11752
Filed Apr. 24, 1970, Ser. No. 22,637
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2

223,936
TOY ELEPHANT FIGURE
Harry Meth and Susan Lake, Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Oct. 26, 1970, Ser. No. 25,670
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2

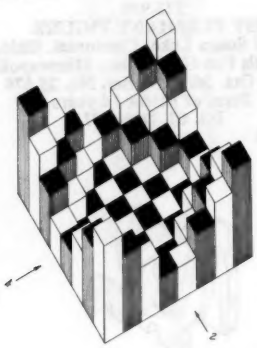
223,937
GAME BOARD
James D. Bissell, Pfafftown, N.C., assignor to Cabitec, Inc., Pfafftown, N.C.
Filed Oct. 20, 1970, Ser. No. 25,567
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



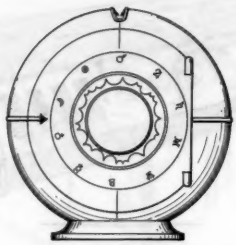
223,938
GAME BOARD OR SIMILAR ARTICLE
Eugene H. Primoff, 15 Whitefield Terrace, New Rochelle, N.Y. 10801
Filed Nov. 25, 1970, Ser. No. 26,156
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



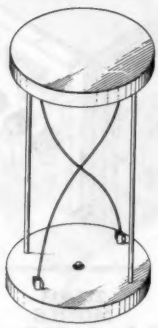
223,939
GAME BOARD
Thomas P. Palazzolo, 1151 Lakepointe, Grosse Pointe Park, Mich. 48230
Filed Apr. 1, 1971, Ser. No. 130,555
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



223,940
MONEY BOX
William Bryan Whitworth, 18 Kimbarra Road, Pymble, New South Wales 2073, Australia
Filed Nov. 30, 1970, Ser. No. 26,214
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—11

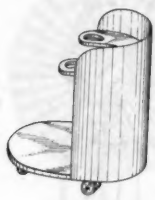


223,941
ILLUMINATING TOY
John R. Parsons, 1425 Lincoln Ave. NE., Renton, Wash. 98055
Filed June 22, 1970, Ser. No. 23,590
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—15

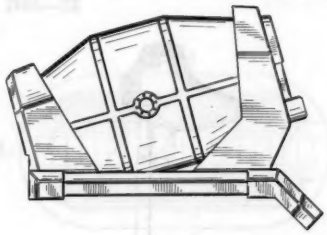


223,942
SNOW SLED
Richard E. Cone, Columbus, Ohio, assignor to The Delphos Bending Company, Delphos, Ohio
Filed Mar. 2, 1971, Ser. No. 120,385
Term of patent 3½ years
Int. Cl. D12—*14*
U.S. Cl. D34—15

223,943
SCOOTER
Robert B. Soper, 12863 South 1480 East, Draper, Utah 84020
Filed Apr. 28, 1971, Ser. No. 138,406
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

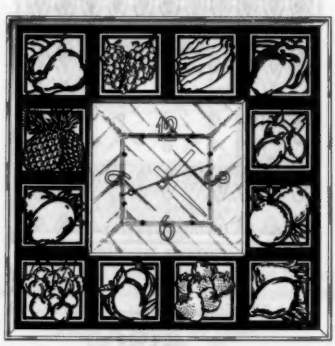


223,944
TOY TRUCK CEMENT MIXER BODY
Theodore H. Zbikowski, Plymouth, and Lee J. Pfeilsticker, Mound, Minn., assignors to Tonka Corporation, Mound, Minn.
Filed May 14, 1971, Ser. No. 143,739
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

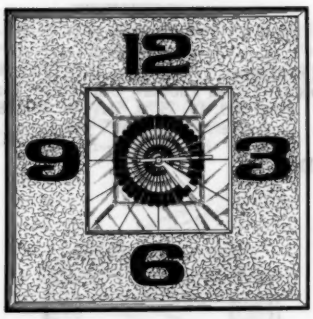


223,945
FLOOR CARE COUPLER
Charles E. Bousquet, 10388 Bassett Drive, Livonia, Mich. 48950
Filed June 22, 1970, Ser. No. 23,610
Term of patent 14 years
Int. Cl. D15—*99*; D8—*05*
U.S. Cl. D37—3

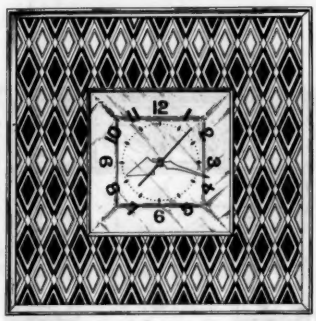
223,946
CLOCK OR SIMILAR ARTICLE
Theodore G. Daher, Stratford, Conn., assignor to General Electric Company
Filed Mar. 31, 1971, Ser. No. 130,051
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D42—7



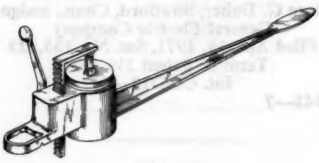
223,947
CLOCK OR SIMILAR ARTICLE
Theodore G. Daher, Stratford, Conn., assignor to General Electric Company
Filed Apr. 19, 1971, Ser. No. 135,523
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D42—7



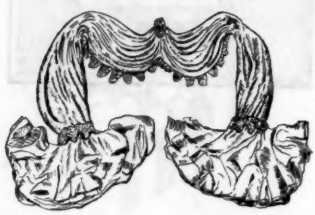
223,948
CLOCK OR SIMILAR ARTICLE
Theodore G. Daher, Stratford, Conn., assignor to General Electric Company
Filed Apr. 19, 1971, Ser. No. 135,524
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D42—7



223,949
NOODLE PRESS
Gertrude Eipper, 1706 N. Arlington St., Milwaukee, Wis. 53202
Filed Nov. 5, 1970, Ser. No. 25,836
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—29

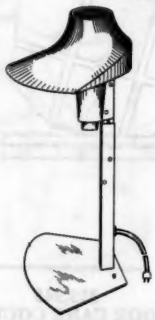


223,950
DRAPES
Edith Rodriguez, Washington, D.C. (P.O. Box 292, Contant 72, St. Thomas, U.S. Virgin Islands)
Filed Oct. 19, 1970, Ser. No. 25,548
Term of patent 7 years
Int. Cl. D6—*10*
U.S. Cl. D47—6

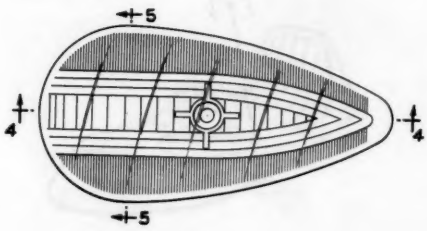


223,951
WALL SCONCE
Andrew J. Wentz, Jr., Hazlet Township, Monmouth County, N.J. (P.O. Box 187, Holmdel, N.J. 07733)
Filed Aug. 24, 1970, Ser. No. 24,654
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2

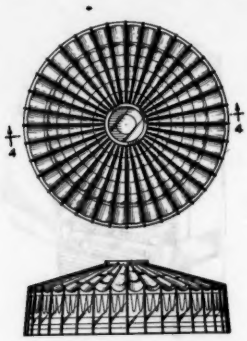
223,952
DESK LAMP
J. Larry Stephans, 216—30 117th Road, Cambria Heights, N.Y. 11411
Filed Oct. 12, 1970, Ser. No. 25,458
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—20



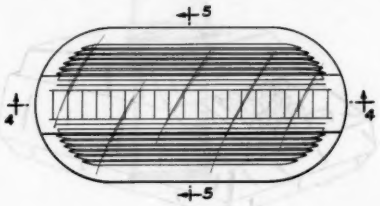
223,953
VEHICLE MARKER LIGHT LENS
Robert I. Nagel, 3729 Roth Terrace, Skokie, Ill. 60076
Filed Oct. 5, 1970, Ser. No. 25,331
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32



223,954
VEHICLE MARKER LIGHT LENS
Robert I. Nagel, Skokie, Ill., assignor to Triangle Mobile Home Products, Inc., Chicago, Ill.
Filed Oct. 5, 1970, Ser. No. 25,340
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32

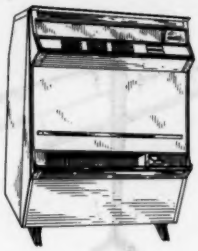


223,955
VEHICLE MARKER LIGHT LENS
Robert I. Nagel, Skokie, Ill., assignor to Triangle Mobile Home Products, Inc., Chicago, Ill.
Filed Oct. 5, 1970, Ser. No. 25,341
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32



223,956
COMBINED TRASH RECEPTACLE AND ADVERTISING DISPLAY
Richard A. Kenerson, New York, N.Y. (Trinity Pass Road, Poundridge, N.Y. 10576)
Filed Sept. 25, 1970, Ser. No. 25,202
Term of patent 14 years
Int. Cl. O7—*05*
U.S. Cl. D49—35

223,957
CIGARETTE VENDING MACHINE
William A. Gran, Independence, Mo., assignor to The Vendo Company, Kansas City, Mo.
Filed Dec. 28, 1970, Ser. No. 26,668
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

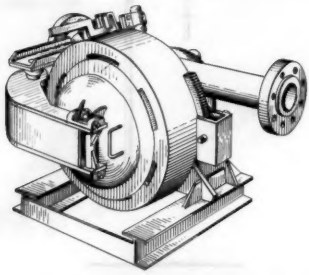


223,958
GLIDESLOPE INDICATOR
Jon W. Hauser, St. Charles, Ill., assignor to General Aviation Electronics, Inc., Indianapolis, Ind.
Filed Oct. 12, 1970, Ser. No. 25,445
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D52—6

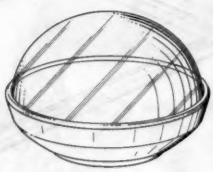
223,959
DRAFTING RULER OR SIMILAR ARTICLE
Mile Vuynovich, Baltimore, and Otto P. Werle, Oxon Hill, Md., assignors to Mile Vuynovich, Baltimore, Md.
Filed Mar. 23, 1971, Ser. No. 127,427
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6

223,960
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to General Mills, Inc.
Filed Nov. 23, 1970, Ser. No. 26,117
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

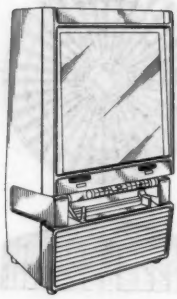
223,961
INSPECTION PRESSURE VESSEL
Henry J. Piegza, Clarence, N.Y., assignor to Welding and Steel Fabrication Co., Inc., Tonawanda, N.Y.
Filed Jan. 25, 1971, Ser. No. 109,732
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1



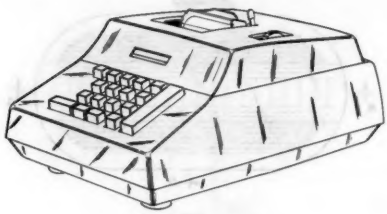
223,962
HOUSING FOR A COMBINED RADIO RECEIVER AND RECORD PLAYER OR SIMILAR ARTICLE
Harvey K. McQuarrie, Kitchener, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada
Filed June 15, 1970, Ser. No. 23,476
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4



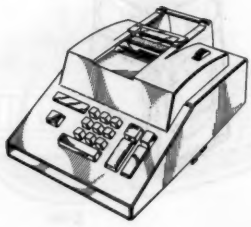
223,963
MICROFORM READER
James C. Kaufman, Dayton, and Richard L. Funkhouser, Kettering, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Nov. 9, 1970, Ser. No. 25,892
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1



223,964
ADDING MACHINE OR THE LIKE
Klaus-Dieter Slama, Bayern, Germany, assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Dec. 14, 1970, Ser. No. 26,484
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11



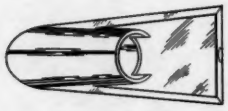
223,965
CALCULATING MACHINE
Yutaka Ohtsu, Sagamihara, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Oct. 19, 1970, Ser. No. 25,541
Claims priority, application Japan May 28, 1970
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11



223,966
PORTABLE SEWING MACHINE HOUSING
Wayne A. Current, Cranford, N.J., assignor to The Singer Company, New York, N.Y.
Filed Aug. 5, 1970, Ser. No. 24,381
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D70—1

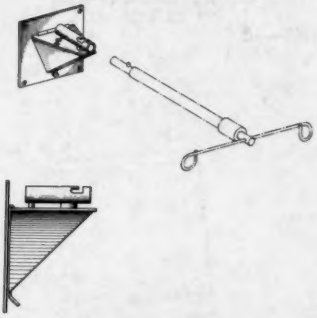
223,967
SIGNAL LIGHT
Jilio J. Petrucelli, P.O. Box 552, Rosamond, Calif. 93560
Filed June 1, 1970, Ser. No. 23,252
Term of patent 14 years
Int. Cl. D29—*02;* D26—*02*
U.S. Cl. D72—1

223,968
STAND FOR AN ELECTRICALLY-POWERED ERASER OR THE LIKE
Francesco Collura, New York, N.Y., assignor to Keuffel & Esser Company, Morristown, N.J.
Filed Dec. 22, 1970, Ser. No. 26,615
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5

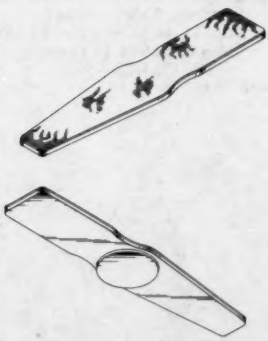


223,969
ELECTRICALLY-POWERED ERASER OR THE LIKE
Francesco Collura, New York, N.Y., assignor to Keuffel & Esser Company, Morristown, N.J.
Filed Dec. 22, 1970, Ser. No. 26,614
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—7

223,970
INTRAVENOUS ROD HOLDER
Joseph P. Saternus, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Mar. 24, 1970, Ser. No. 22,196
Term of patent 14 years
Int. Cl. D24—*02;* D8—*03*
U.S. Cl. D83—1



223,971
SUNBATHING DEVICE
Jean L. Wortman, 1513 Juanita St., Boise, Idaho 83706
Filed Apr. 29, 1971, Ser. No. 138,857
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1



223,972
NURSING NIPPLE FOR USE WITH A NURSING BOTTLE
Michael C. Ritsi, 7950 SW. 16th St., Miami, Fla. 33155
Filed Mar. 23, 1970, Ser. No. 22,029
Term of patent 14 years
The portion of the term of the patent subsequent to May 13, 1983, has been disclaimed
Int. Cl. D24—*05*
U.S. Cl. D83—8

223,973
ILLUMINABLE MAKEUP MIRROR OR SIMILAR ARTICLE
Edward A. Irelan, Lombard, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed July 9, 1970, Ser. No. 24,219
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

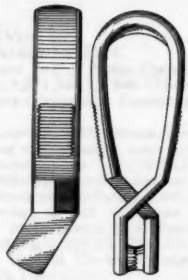
223,974
COMBINED SHOE HORN AND KEY HOLDER
Thomas K. Tsutsui, 16824A Denker Ave., Gardena, Calif. 90247
Filed Aug. 12, 1970, Ser. No. 24,457
Term of patent 14 years
Int. Cl. D28—*99*
U.S. Cl. D86—10

223,975
HAIR DRYER
Jurgen Greubel, Schone Aussicht, Germany, assignor to A. G. Braun, Frankfurt am Main, Germany
Filed Nov. 16, 1970, Ser. No. 26,031
Claims priority, application Germany May 26, 1970
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

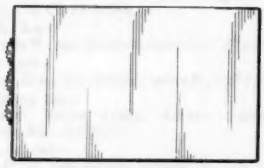
223,976
STEAM HAIR CURLER HOUSING
Clifford E. Grube, Niles, and Richard J. Stern, Glencoe, Ill., assignors to Associated Mills, Incorporated
Filed Dec. 17, 1970, Ser. No. 26,541
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

223,977
COMBINED DOLL AND MIRROR
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Filed Jan. 8, 1971, Ser. No. 105,146
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

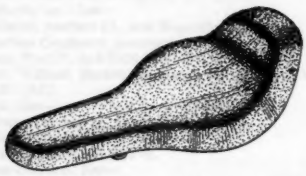
223,978
SURGICAL CLIP
Raymond John, Carpentersville, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Oct. 16, 1970, Ser. No. 25,525
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12



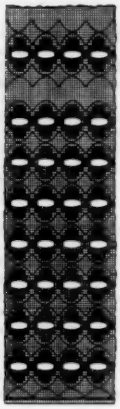
223,979
CARD EJECTOR CASE, OR SIMILAR ARTICLE
Jay Ehrensaal, Forest Hills, N.Y., assignor to Swank, Inc., New York, N.Y.
Filed July 9, 1970, Ser. No. 23,879
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—3



223,980
BICYCLE SEAT
Albert J. Fritz, Northbrook, and Anton J. Panzica, Hinsdale, Ill., assignors to Schwinn Bicycle Company, Chicago, Ill.
Filed Dec. 31, 1970, Ser. No. 26,724
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D90—16



223,981
CURTAIN FABRIC
Heinrich Oelmann, 25 Im Bungert, 7891 Dogern, Germany
Filed June 8, 1970, Ser. No. 23,385
Claims priority, application Germany Dec. 11, 1969
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D92—1



223,982
CURTAIN FABRIC
Heinrich Oelmann, 25 Im Bungert, 7891 Dogern, Germany
Filed June 8, 1970, Ser. No. 23,388
Claims priority, application Germany Dec. 11, 1969
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D92—1

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JUNE, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Ardal og Sunndal Verk: *See—*
Schneider, Paul Adrian. 3,670,971.

Aagaard, Einar Andreas, to U.S. Philips Corporation. Binary storage circuit arrangement. 3,671,946, Cl. 340-173.0ff.

Aarup, Carl P., to Dura Corporation. Coaster vehicle. 3,671,055, Cl. 280-87.010.

Abardovsky, Isaak Pavlovich; and Gertsman, Lev Alexandrovich. Unit for calendering pipes and extracting cores therefrom in a machine for producing fibrocement pipes. 3,671,387, Cl. 162-284.000.

Abbot, Charles G. Unlimited quantity of power from solar radiation secured with zero atmospheric pollution. 3,670,717, Cl. 126-270.

Abbott, Robert Plowden, to Bell Telephone Laboratories, Incorporated. Recovery of horizontal sync pulses from a composite synchronizing format. 3,671,669, Cl. 178-7.30s.

Abbott, Roy W., to General Electric Company. Gas-fired heater means. 3,670,713, Cl. 126-110.00r.

Abe, Isamu; Yashiro, Hideo; Sori, Naoyuki; Hatano, Sotaro; Katsumoto, Tomiyasu; and Suzuki, Tadao, to Tokyo Shibaura Electric Co., Ltd. Method of making a honeycomb block collimator. 3,670,395, Cl. 29-471.100.

Abele, Manfred: *See—*
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Abolins, Visvaldis, to General Electric Company. Glass reinforced polyester resins containing polytetrafluoroethylene and other flame retardant additives. 3,671,487, Cl. 260-40.00r.

Abuel-Haj, Marwan J., to Pfizer, Inc. 2-Heterocyclic substituted quinoxaline-1, 4-dioxides. 3,671,521, Cl. 260-244.00r.

ACF Industries, Incorporated: *See—*
Thornton, Duane V., 3,670,664.

Ackerman, Daniel Whitney, to Universal Instruments Corporation. Wire wrapping tool. 3,670,784, Cl. 140-118.000.

ACME Maschinenfabrik GmbH: *See—*
Faure, Robert, 3,670,458.

Adachi, Toshio; Onishi, Masayoshi; and Hayashi, Kiyohide, to Daido Seiko Kabushiki Kaisha. Electrical transfer type plasma arc melting furnace. 3,671,655, Cl. 13-1.000.

Adamek, John A.: *See—*
Turner, Lyman H.; and Adamek, John A., 3,671,094.

Adams, James E.: *See—*
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Adams, James Ewing: *See—*
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Adams, John A., Jr.: *See—*
Lee. Ernest O., Jr.; and Adams, John A., Jr., 3,671.677.

Adamson, J. Eric: *See—*
Wahlstrom, P. Borje; and Adamson, J. Eric, 3,671,389.

Addressograph-Multigraph Corporation: *See—*
Kumins, Charles A., 3,671,232.

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Aeromarine Corporation: *See—*
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AGA Aktiebolag: *See—*
Smars, Erik Algot, 3,671,883.

Agfa-Gevaert Aktiengesellschaft: *See—*
Engel, Herbert; Hartwig, Karl; and Schnall, Gunther, 3,671,119.
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Aim Products, Inc.: *See—*
Kvalheim, Andrew M.; and Wassem, Howard M., 3,671,369.

Air Reduction Company, Incorporated: *See—*
Duron, Paul P.; and Rich, Harold T., 3,670,516.
Laird, William Burton; Williams, Roy L.; and Muska, Allen V., 3,671,022.

Airco, Inc.: *See—*
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Yamada, Yoshitaka; Sakurai, Moritaro; and Kumashiro, Izumi, 3,671,649.

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Fukuda, Hideo; Suzuki, Takashi; Sumino, Yasuhiro; and Akiyama, Shunichi, 3,671,395.

Aktiebolaget Bofors: *See—*
Andersson, Ake Paul; and Wegmar, Per Augustin, 3,671,050.

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Jakobsen, Kjell Moswoll; and Eriksson, Hanslivar, 3,671,386.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Kramer, Wilhelm, 3,671,698.

Akuta, Tomohiko; Seya, Atsumi; and Hashirizaki, shinya, to Yawata Iron & Steel Co., Ltd. and Mitsubishi Seiko Kabushiki Kaisha. Method for measuring a weighing load rapidly. 3,670,833, Cl. 177-1.000.

Alarm Products International, Inc.: *See—*
Parlato, Philip J., 3,671,690.

Albers, Edwin Wolf: *See—*
Maher, Philip Kenerick; Albers, Edwin Wolf; and McDaniel, Carl Vance, 3,671,191.

Albers, Walter A., Jr., to General Motors Corporation. Process for making tetragonalgermanium dioxide. 3,671,309, Cl. 117-201.000.

Albert, Donald J., to Eastman Kodak Company. Exposure device for controlling charge on a portion of a charged surface bordering an image frame projected on the charged surface. 3,671,121, Cl. 355-7.000.

Albrecht, Rudolf; Kessler, Hans-Joachim; and Schroder, Eberhard, to Schering AG. Antimicrobial indanones. 3,671,520, Cl. 260-240.00a.

Alderson, William T. Fluid energy machine. 3,671,146, Cl. 417-243.000.

Alexander, Newton C.; Stark, Herbert; and Thornton, Richard C., to Northrop Corporation. Attitude readout for floated inertial platform. 3,670,585, Cl. 74-5.600.

Ali, Mir Akbar; and Pincus, Alexis G., to IIT Research Institute. UV transmitting borosilicate glass composition and article. 3,671,380, Cl. 161-175.

Alibrandi, Joseph P.: *See—*
Rutherford, Kenneth R.; Hooker, Marvin L., Jr.; and Alibrandi, Joseph P., 3,671,866.

All Products Company: *See—*
Smith, Van Z., 3,670,471.

Allen, Lloyd R., to National Research Corporation. Boron carbide film product. 3,671,306, Cl. 117-138.80n.

Allen, Robert C., Sr., to Atomic Power Development Associates, Inc Heat exchanger. 3,670,810, Cl. 165-70.000.

Allen, Wallace Peyton. Microwave sewage treatment system 3,670,891, Cl. 210-128.000.

Allied Chemical Corporation: *See—*
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Allis-Chalmers Manufacturing Company: *See—*
Brunner, Richard G., 3,671,696.
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Matthews, Ralph W.; Bernhoft, Gerald W.; and Schmidt, Michael R., 3,670,823.
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Ross, Ray C.; and Crum, Robert L., 3,670,835.
Thiele, Tom N.; Gerlach, Lester O.; and Gilmore, Thomas P., 3,671,746.

Allison, Rudolph L., to Paramount Textile Machinery Company. Semiautomatic vending machine including memory circuit. 3,670,860, Cl. 194-1.00j.

Allison, William W., to Armec Corporation. Timing motor with resonant members. 3,671,825, Cl. 318-128.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
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Almond, Elmer C., to Budd Company, The. Method of forming honeycombe panel. 3,670,393, Cl. 29-423.900.

Alpert, Arnold L. Food containerization. 3,670,916, Cl. 220-9.00f.

Alsco, Inc.: *See—*
Nash, John J., 3,670,621.

Alt, Gerhard H., to Monsanto Company. Inhibiting the growth of plants with substituted indole derivatives. 3,671,214, Cl. 71-95.000.

Altenburger, Otto, to Stromberg-Carlson Corporation. Ringing control circuit. 3,671,678, Cl. 179-18.0hb.

Altermatt, Rudolf; Entschel, Roland; and Mueller, Curt, to Sandoz Ltd. Basic anthraquinone dyes, with pyridinium 2- or 4-dimethylene groups. 3,671,529, Cl. 260-294.80b.

Altounyan, Roger Edward, to Fisons Pharmaceuticals Limited. Compositions for treating asthma comprising bis-chromonyl compounds and method of employing same. 3,671,625, Cl. 424-45.000.

Amagi, Yasuo; Ohya, Masaki; Shiiki, Zenya; and Yusa, Haruhiko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cross-linked graft copolymer of styrene and methyl methacrylate upon a butadiene polymer. 3,671,610, Cl. 260-880.

Amano, Kitsutaro, to Kokusai Denshin Denwa Kabushiki Kaisha. Binary to ternary converter. 3,671,959, Cl. 340-347.0dd.

Amchem Products, Inc.: *See—*
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American Hospital Supply Corporation: *See—*
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American Optical Corporation: *See—*
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American Standard Linear Systems, Inc.: *See—*
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American Sterilizer Company: *See—*
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Amerock Corporation: *See—*
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Ametek, Inc.: *See—*
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Ammon & Champion Company, Inc.: *See—*
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Amoco Production Company: *See—*
Dauben, Dwight L.; Froning, H. R.; and Jones, Loyd W., 3,670,819.

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AMP Incorporated: *See—*
Baker, Charles Edward, II; and Casciotti, Albert, 3,671,921.

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Andrews, Robert S., Jr.; and McDaniels, William C., to N L Industries, Inc. Lignite products and compositions thereof. 3,671,427, Cl. 252-8.50m.

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Anfruns, Luis Sentis. Sock ironing device. 3,670,932, Cl. 223-75.000.

Angibaud, Rene M., to Societe Les Piles Wonder. Reloadable electric flashlight. 3,671,734, Cl. 240-10.060.

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Bobb, Paul D., 3,670,473.

Aronica, Claude S.; and Moulin, Louis, to Pechiney-Progil. Insecticidal compositions of endosulfan in fenitrothion for U.L.V. treatment. 3,671,632, Cl. 424-218.

Arrance, Frank C., to McDonnell Douglas Corporation. Battery electrode and battery embodying same. 3,671,319, Cl. 136-6.000.

Arrington, William L.; Gantt, Wayne Carlton; and Gouger, Leonard Joseph, to GTE Sylvania Incorporated. Non-inflammable horizontal output transformer. 3,671,903, Cl. 336-96.000.

Arthur, Wallace W.: *See—*
Hanson, Laurence B.; and Arthur, Wallace W., 3,670,826.

Artz, Klaus; Desai, Nalin Binduprasad; and Liechti, Hans Wilhelm, to Ciba-Geigy AG. Azo dyestuffs and a process for dyeing or printing polyester fibers with such dyestuffs. 3,671,177, Cl. 8-41.00c.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Yasui, Koichi; Yamamoto, Kazuo; Itami, Kazuo; Fujisawa, Kiyoshi; and Saskai, Toshio, 3,671,279.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Mori, Chiharu; and Nakajima, Toru, 3,670,637.

Asal, Jerrold R.; and Piepho, Donald A., to Caterpillar Tractor Company. Power angling bulldozer. 3,670,825, Cl. 172-805.000.

Ashland Oil, Inc.: *See—*
Sedor, Edward A.; and Slagel, Robert C., 3,671,473.

Ashworth, James E., to United States Steel Corporation. Internal coupling for connecting U-shaped rails. 3,671,062, Cl. 287-127.000.

Aske, Charles B., Jr. Vehicle wheel trim. 3,671,076, Cl. 301-37.00r.

Asper, Theodor. Vending system using a value storing key. 3,670,924, Cl. 222-2.000.

Associated Electrical Industries Limited: *See—*
Browning, George William, 3,671,742.

Associated Engineering Limited: *See—*
Bemrose, Colin R., 3,670,812.

Assouline, George; Conjeaud, Pierre; Girault, Pierre; and Leiba, Eugene, to Thomson-CSF. Blind landing aids. 3,671,963, Cl. 343-6.0nd.

ATCO Surgical Supports Co.: *See—*
Johnson, Leona M., 3,670,738.

Ateliers Diderichs: *See—*
Deborde, Albert, 3,670,779.

Ati, Inc.: *See—*
Erb, Gilbert E., 3,671,126.

Atlantic Richfield Company: *See—*
Striegler, John H., 3,670,832.
Yoo, Jin Sun, 3,671,565.

Atlas Chemical Industries, Inc.: *See—*
Moyant, Donald A., 3,670,925.
Rutledge, Thomas F., 3,671,604.
Sherman, Albert H.; and Zech, John D., 3,671,458.
Slawinski, Frank E., 3,671,342.

Atlas Hoist & Body Inc.: *See—*

Gladysz, Wiktor, 3,671,016.
Atomic Power Development Associates, Inc.: *See—*
Allen, Robert C., Sr., 3,670,810.
Aucouturier, Jeanne; and Lacaze, Rene, to Thomson-CSF. Graded field magnets. 3,671,895, Cl. 335-212.000.
Audac Corporation: *See—*
Kuehnle, Manfred R., 3,671,120.
Auphan, Michel Joseph: *See—*
Perilhou, Jean Robert; and Auphan, Michel Joseph, 3,670,715.
Aurnhammer, Robert: *See—*
Schlecht, Helmut; and Aurnhammer, Robert, 3,671,584.
Auto Research Corporation: *See—*
Reeve, Paul H., 3,671,148.
'Automatic' Sprinkler Corporation of America: *See—*
Gould, Bruce Michael, 3,670,534.
Automobiles Peugeot: *See—*
Falay, Bernard; and Froumajou, Armand, 3,670,586.
Avant Industries, Inc.: *See—*
Ettlinger, Ralph, Jr.; and Strobl, Frederick P., Jr., 3,670,911.
Avco Corporation: *See—*
Doyle, Brian W., 3,671,171.
Mertens, William J., 3,670,651.
Shank, Wayne C., 3,671,140.
Slayden, James D., 3,671,063.
Averton Gear and Tool Corporation: *See—*
Leming, John C., 3,670,583.
Avery, Roger Peter: *See—*
Zerlin, William Max Erich; Avery, Roger Peter; and Royce, David Hugh, 3,671,922.
Ayers, James E.: *See—*
Fernandez, Jaime B.; and Ayers, James E., 3,671,652.
Ayerst, McKenna and Harrison Limited: *See—*
Bagli, Jehan F.; and Bogri, Tibor, 3,671,570.
Ayukawa, Yaichi; Naruse, Uhei; Itoh, Tadayoshi; and Miyakawa, Tsuneaki, to CPC International, Inc., mesne. Artificial shrimp feed. 3,671,261, Cl. 99-2.00r.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Decker, Martin; Schmidt, Joseph; Hoffmann, Herwig; and Pistor, Hans Joachim, 3,671,566.
Fischer, Adolf; Koenig, Karl-Heinz; Steinbrunn, Gustav; and Zschocke, Albrecht, 3,671,586.
Hagen, Helmut; and Becke, Friedrich, 3,671,522.
Kaufman, Otto; Daeuble, Manfred; Witsch, Heinz-Guenter; Luebcke, Enno; and Bayew, Dimiter, 3,671,176.
Koenig, Karl-Heinz; Steinbrunn, Gustav; Windel, Hermann; and Fischer, Adolf, 3,671,571.
Patsch, Manfred; and Eilingsfeld, Heinz, 3,671,536.
Reicheneder, Franz; and Kropp, Rudolf, 3,671,525.
Schlecht, Helmut; and Aurnhammer, Robert, 3,671,584.
Zschocke, Albrecht; Rohr, Wolfgang; and Fischer, Adolf, 3,671,540.
Baer, Massimo; and Campbell, Joseph O., to Monsanto Company. Glass fiber reinforced composite and method of making same. 3,671,378, Cl. 161-170.000.
Baer, Massimo; and Campbell, Joseph O., to Monsanto Company. Glass concentrate capsules. 3,671,384, Cl. 161-170.000.
Baerg, William; and Saint Guilhem Humber, Pierre. Reverse osmosis apparatus. 3,670,892, Cl. 210-134.000.
Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna and Harrison Limited. Derivatives of 9-oxo-15-hydroxyprostanoic acid, homologs thereof and their preperation. 3,671,570, Cl. 260-468.00r.
Bahr, William T.; and Lewis, Robert V., to Anaconda American Brass Company. Controlled leakage conduit for delivering a fluid to a heat source. 3,670,774, Cl. 138-178.000.
Bailey, James L.; and Rodgers, Franklin A., to Polaroid Corporation. Coated silicone rubber mold. 3,671,007, Cl. 249-114.000.
Baker, Charles Edward, II; and Casciotti, Albert, to AMP Incorporated. Multi-contact electrical connector. 3,671,921, Cl. 339-59.00m.
Baker, Donal E., to Westinghouse Electric Corporation. DC power controller with static switching elements and common current feedback transformer between direct voltage source and load. 3,671,844, Cl. 321-2.000.
Baker Equipment Engineering Co., Inc.: *See—*
Milner, Edwin Earl, Jr., 3,670,849.
Baker Perkins Inc.: *See—*
Levi, George A., 3,670,665.
Baker, William A.: *See—*
Vieson, John W.; and Baker, William A., 3,670,474.
Bakke, Roger M., to International Business Machines Corporation. Dead time process regulation. 3,671,725, Cl. 235-150.100.
Ball, Rowland E., to Borg-Warner Corporation. Centrifugal pump with hydrostatic bearing. 3,671,137, Cl. 415-104.000.
Ball, Rowland E., to Borg-Warner Corporation. Composite knockdown pump. 3,671,138, Cl. 415-111.000.
Ballou, Richard P., to General Motors Corporation. Vehicle headlight control circuit using an auxiliary contact on the dimmer switch. 3,671,802, Cl. 315-83.000.
Balser, Martin: *See—*
Proudian, Andrew Peter; and Balser, Martin, 3,671,927.
Bara, Edward S., to Warwick Electronics Inc. Record changer. 3,671,045, Cl. 274-10.00r.
Barclay, Kenneth M.: *See—*
Lefrancois, Philip A.; and Barclay, Kenneth M., 3,671,185.
Bargain, Michel, to Rhone-Poulenc S.A. cross-linked polyimides. 3,671,490, Cl. 260-47.0cp.
Barnes, Billy W., to Sperry Rand Corporation. Vehicular tilt sensor having margin of safety adjustment. 3,671,933, Cl. 340-52.00h.
Barnes, Jon F.; and Johnson, James L., to General Tire & Rubber Company, The. Poromeric material having a patent leather-type finish and process for making. 3,671,345, Cl. 156-77.000.
Barnes, Lell E.; and Morris, David, to Singer Company, The, mesne. Saturated core transient current limiter. 3,671,810, Cl. 317-20.000.
Barnes, Robert L.; Block, William M.; and Grafstein, Danel, to Singer Company, The, mesne. Polysiloxane copolymers derived from the carborane-silicon phthalocyanine monomer. 3,671,489, Cl. 260-46.50e.
Barnett, Jackson Herman, Jr. Method for impregnating wood. 3,671,299, Cl. 117-116.000.
Barnett, James A.: *See—*
Dieterich, Frank L., 3,670,444.
Barnikol-Oettler, Kurt: *See—*
Teichmuller, Gerhard; Barnikol-Oettler, Kurt; and Hartmann, Werner, 3,671,555.
Barrett, Ernest Charles Henry, to London & Scandinavian Metallurgical Co., Limited. Electro-deposition of nickel. 3,671,409, Cl. 204-49.000.
Bartels, Herbert D., to Continental Can Company, Inc. Stress relieved container and method of making same. 3,670,921, Cl. 220-75.000.
Basham, Edward R.; and Smith, William D., to Go International, Inc. Apparatus for attaching a tool to a conduit in a borehole. 3,670,566, Cl. 73-151.000.
Basman, Vefik A. Automatic antenna alignment system for enabling maximum signal reception. 3,671,969, Cl. 343-117.00r.
Bata Shoe Company, Inc.: *See—*
Joosten, Hendrik, 3,670,698.
Bates, Charles E.: *See—*
Burch, Arthur R.; and Bates, Charles E., 3,670,905.
Battelle Development Corporation: *See—*
Radke, Lawrence F.; and Hobbs, Peter V., 3,671,128.
Battelle Development Corporation, The: *See—*
Mc Intire, Hoy C.; and Vanorsdel, John R., 3,671,228.
Baxter Corporation, The, mesne: *See—*
Dubner, Harvey, 3,671,944.
Baxter Laboratories, Inc.: *See—*
Regan, Bernard M., 3,671,645.
Bayew, Dimiter: *See—*
Kaufman, Otto; Daeuble, Manfred; Witsch, Heinz-Guenter; Luebcke, Enno; and Bayew, Dimiter, 3,671,176.
Beachley, Robert W. Lighting standard or pole with doubly hinged base. 3,671,738, Cl. 240-84.000.
Beaudoin, Benoit R.; Cohen, Joseph D.; Jones, David H.; Marier, Lester J., Jr.; and Raab, Harry F., Jr., to United States of America, Atomic Energy Commission, mesne. Light-water breeder reactor. 3,671,392, Cl. 176-18.000.
Bechtel, John D.: *See—*
Szumila, Anthony D.; Zimnoch, Joseph J.; Bechtel, John D.; and Steinberg, Harvey M., 3,671,865.
Becke, Friedrich: *See—*
Hagen, Helmut; and Becke, Friedrich, 3,671,522.
Becker, John E., to Eclipse Consultants Limited. Hydraulic couplings. 3,670,498, Cl. 60-54.000.
Becker, John E., to Motorola, Inc. Protection circuit for an amplifier. 3,671,878, Cl. 330-207.00p.
Becton, Dickinson and Company, mesne: *See—*
Mahon, Thomas J.; and Cherba, Samuel, 3,670,726.
Behn, Reinhard; Gottlob, Heinrich; Haid, Hans; Hoyler, Gerhard; and Kessler, Hartmut, to Siemens Aktiengesellschaft. Process for the production of capacitors. 3,670,378, Cl. 29-25.420.
Beidler, William F., to Treadline Fastener Corporation. Self-locking tubular insert. 3,670,794, Cl. 151-7.000.
Belcher, Richard A.: *See—*
Kozacka, Frederick J.; and Belcher, Richard A., 3,671,909.
Belew, Herschel W., Jr.: *See—*
Davis, John W.; and Belew, Herschel W., Jr., 3,670,564.
Belke Manufacturing Company: *See—*
Belke, Ralph E., 3,671,416.
Belke, Ralph E., to Belke Manufacturing Company. Bulged sphincteral seals for electroplating racks. 3,671,416, Cl. 204-297.00r.
Bell & Howell Company: *See—*
Hull, Charles W., 3,671,737.
Bell Telephone Laboratories, Incorporated: *See—*
Abbott, Robert Plowden, 3,671,669.
Duguay, Michel Albert, 3,671,747.
Healey, Anthony John, 3,670,753.
Henry, James L.; and Schimpf, Luther G., 3,671,676.
Knollman, Dieter John Henry; and Simon, James Louis, 3,671,942.
Miller, Calvin Max; and Sacks, Robert Charles, 3,671,662.
Ngo, Dinh-Tuan, 3,671,938.
Pento, Frank Louis, 3,671,875.
Pitetti, Raymond Charles; and Worobey, Walter, 3,671,823.
Saltzberg, Burton R., 3,671,670.
Trimble, David Carlaw, 3,671,939.
Weischedel, Herbert Rudolf; and Westerman, George Raymond, 3,671,853.

Bellis, Harold Edward, to Du Pont de Nemours, E. I., and Company. Low temperature melt chlorination process. 3,671,596, Cl. 260-658.00r.

Bellmann, Alfred, to International Standard Electric Corporation. Contact spring assembly for relays and similar switches. 3,671,701, Cl. 200-166.00j.

Bellsmith, Travis L.; and Fields, Richard W., to Velsicol Chemical Corporation. Silvicidal composition and method. 3,671,215, Cl. 71-97.000.

Belttary, Harold E.; and Palmer, John G., to Zinsco Electrical Products. Circuit breaker. 3,671,908, Cl. 337-54.000.

Bement, Laurence J., to United States of America, National Aeronautics and Space Administration. Linear explosive comparison. 3,670,559, Cl. 73-35.000.

Bemrose, Colin R., to Associated Engineering Limited. Heat exchangers. 3,670,812, Cl. 165-175.

Bender, Lloyd F. Solenoid operated, two way diverter valve for fluid line washing apparatus. 3,670,744, Cl. 134-57.00r.

Bendix Corporation, The: *See—*
McKeown, James E., 3,671,842.
Sanders, Bobby J., 3,671,868.

Benes, Rudolf: *See—*
Brazda, Ladislav, deceased; Brazdova, Dagmar; heirs; Prochazka, Miloslav; Kuhn, Vladimir; Ozdian, Josef; and Benes, Rudolf, 3,670,484.

Benjamin, Rose Ellen; and Hudis, Ann. Clothes rejuvenator. 3,670,425, Cl. 34-46.000.

Bennett, Alan E. C.; and Bewick, Michael. Transfusion needles. 3,670,729, Cl. 128-214.400.

Bennett, John D., to Sun Oil Company (Delaware). Explosive drilling apparatus. 3,670,828, Cl. 175-4.500.

Benson, John T.: *See—*
Lemkin, Jack L.; Leistikow, Gerard K.; Edmisson, Russell C.; and Benson, John T., 3,670,449.

Bentsen, Louis J., to Honeywell Inc. Diaphragm logic control circuit for electric heating system. 3,670,745, Cl. 137-84.000.

Berg, Max H., to Berg, Peter & Co., Inc. Collapsible carton. 3,670,948, Cl. 229-33.000.

Berg, Peter & Co., Inc.: *See—*
Berg, Max H., 3,670,948.

Berger, John G., to General Electric Company. Riveting device. 3,670,943, Cl. 227-60.000.

Bergman, Robert N. Combination toasting and buttering apparatus. 3,670,642, Cl. 99-329.0rt.

Bergmanis, Karlis Alfredovich; Klotinsh, Erik Ernestovich; and Matis, Imant Gustovich. Device for measuring permittivity of materials. 3,671,857, Cl. 324-61.0qs.

Bergna, Horacio E., to Du Pont de Nemours, E. I., and Company. Nickel-molybdenum bonded titanium nitride-titanium carbide. 3,671,201, Cl. 29-182.500.

Bergstrom, Berit P. Chairs. 3,671,074, Cl. 297-239.000.

Berkholcs, Gordon, to Continental Machines, Inc. Adjustable traverse control for surface grinder. 3,670,457, Cl. 51-92.00r.

Berkowitz, Irving L., to Kason Hardware Corporation. Refrigerator wall panels with panel fasteners and apparatus for making said panels. 3,671,006, Cl. 249-97.000.

Bernath, Louis; and Facha, Joseph V., to North American Rockwell Corporation. Articulated fuel element housing. 3,671,394, Cl. 176-79.000.

Bernhoft, Gerald W.: *See—*
Matthews, Ralph W.; Bernhoft, Gerald W.; and Schmidt, Michael R., 3,670,823.

Berry, Currie B., Jr., to Ethyl Corporation. Foamed metal. 3,671,221, Cl. 75-20.00f.

Berry, Harry E., 20% to Kerek, Richard, 20% to Kerek, John and 20% to De La Hunt, R. E. Beverage dispensing keg. 3,670,929, Cl. 222-400.700.

Berry, Walter Cunningham, Jr., to Du Pont de Nemours, E. I., and Company. Gas purging of spinning packs. 3,671,653, Cl. 264-39.000.

Bersin, Richard L., to International Plasma Corporation. Method and apparatus for ashing organic substance. 3,671,195, Cl. 23-230.0pc.

Berstorff, Hermann, Maschinenbau GmbH: *See—*
Hoever, Heinz; and Orth, Herbert, 3,670,644.

Bertea Corporation: *See—*
Stevens, Curtis Edgar, 3,671,082.

Bethlehem Steel Corporation: *See—*
Charchalis, Taras I., 3,670,884.
Humphries, Darral V., 3,671,622.

Bettini, Dino: *See—*
Muller, Erwin; and Bettini, Dino, 3,671,791.

Betts, Anson G. Treatment of phosphate rock with acids. 3,671,189, Cl. 23-88.000.

Betts, William M. Marine mufflers. 3,670,845, Cl. 181-57.000.

Beukers, John M.; and Williams, Christian B., to United States of America, Army. Two channel direction finder. 3,671,968, Cl. 343-113.0de.

Bewick, Michael: *See—*
Bennett, Alan E. C.; and Bewick, Michael, 3,670,729.

Bickham, Richard E.: *See—*
Lindley, Ralph H.; and Bickham, Richard E., 3,671,961.

Biernath, Emil; and Burkard, Hans, to Excentra Gesellschaft mit beschrankter Haftung. Radial piston machine. 3,670,629, Cl. 92-72.000.

Biernson, George; Euling, Raymond; and Jones, Paul W., to Sylvania Electric Products, Inc. Optical low-pass spatial filter. 3,671,107, Cl. 350-162.0sf.

Bieser, Albert H. Credit card verification system. 3,671,717, Cl. 235-61.11c.

Bilas, Michael. Tiltable mounting for dump truck bodies. 3,671,073, Cl. 298-17.

Billaz, Rene: *See—*
Faidutti, Michel; Boileau, Jacques; Konrat, Jean-Paul; and Billaz, Rene, 3,671,535.

Billot, Jean, to Rafaut & Cie. Control and safe-starting device for use in a detachable missile. 3,670,654, Cl. 102-70.26a.

Bingham, Bruce N., to Amerock Corporation. Slidable bolt catch. 3,671,065, Cl. 292-175.000.

Bio-Logics, Inc.: *See—*
Davis, Louis E.; Jensen, Billy M.; Larson, Floyd L.; Huck, Rainer F.; and Stumph, Stephen L., 3,670,386.

Bird & Son, Inc.: *See—*
Weaver, Leonard Wheelock, 3,670,505.

Bischoff Chemical Corporation: *See—*
Nussbaum, Frank J., 3,671,168.

Bissonette, Vernon L.; Miller, Jerry B., deceased (by Miller, Carol K.; executrix), said Bissonette assor. to Eastman Kodak Company. Process for forming dye images. 3,671,244, Cl. 96-54.000.

Bittscheidt, Josef: *See—*
Seifert, Friedrich; and Bittscheidt, Josef, 3,671,663.

Black and Decker Manufacturing Company, The: *See—*
Weber, Edwin J., 3,670,413.

Blackstone, John A. Transfer tail clamping apparatus. 3,670,777, Cl. 139-247.000.

Blain, William A.: *See—*
Griner, Arthur J.; and Blain, William A., 3,671,163.

Blake, Anthony; Halliday, Denis Malcolm; and Woods, Michael Faulkner, to Lever Brothers Company. Ice-cream products. 3,671,268, Cl. 99-136.000.

Blanchard, David L.: *See—*
Donahue, William J.; Blanchard, David L.; and Wack, John M., 3,670,656.

Bland, John: *See—*
Eyre, Brian; and Bland, John, 3,671,075.

Blankenstein, Gunter: *See—*
Kunzel, Hans-Egon; Wolf, Gerhard Dieter; Blankenstein, Gunter; and Nischk, Gunther, 3,671,614.

Blanshine, Allison W.; and Pucher, Richard A. Two row row crop attachment with lower crop gathering means at the center than at the sides. 3,670,482, Cl. 56-98.000.

Blatter, Herbert Morton: *See—*
Mizzoni, Renat Herbert; and Blatter, Herbert Morton, 3,671,512.

Blaupunkt-Werke GmbH: *See—*
Wellhausen, Heinz, 3,671,870.

Blazer Corporation: *See—*
El-Tahry, Mahmoud S., 3,670,809.

Blazevic, Milos; and Kohn, Joseph. Magnetic recording and playback instrument and support for magnetic recording. 3,671,044, Cl. 274-4.00j.

Bledsoe, James O., Jr., to SCM Corporation. Myrcene epoxide diels-alder adducts. 3,671,551, Cl. 260-348.00r.

Bleibtreu, Alexander, to Maschinenfabrik Reinhausen Gebruder Scheubeck K.G. Transfer switch for tap-changing regulating transformers including lost motion interconnection driving mechanism. 3,671,687, Cl. 200-11.0tc.

Block, William M.: *See—*
Barnes, Robert L.; Block, William M.; and Grafstein, Danel, 3,671,489.

Blomgren, Oscar C., Jr.: *See—*
Blomgren, Oscar C., Sr.; and Blomgren, Oscar C., Jr., 3,670,606.

Blomgren, Oscar C., Sr.; and Blomgren, Oscar C., Jr., to Inter-Probe, Inc. Method and apparatus for cooling the workpiece and/or the cutting tools of a machining apparatus. 3,670,606, Cl. 82-1.00c.

Bloom, Roy C.: *See—*
Eldridge, Merle K.; Bloom, Roy C.; and Joseph, Douglas C., 3,671,248.

Blount, George W., to New Century Products, Inc. Hinged cover construction for a water closet. 3,670,441, Cl. 4-236.000.

Blumcraft of Pittsburgh: *See—*
Horgan, William J., Jr., 3,670,537.

Bobb, Paul D., to Armstrong Cork Company. Method of packing chair seats. 3,670,473, Cl. 53-37.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Wiedeking, Elmar, 3,671,129.

Boeing Company, The: *See—*
Fries, James R., 3,671,967.
Jenny, Robert W., 3,670,996.
Layton, John E., 3,671,970.
Lee, Shi K., 3,671,951.
Leonard, Donald E., 3,670,988.

Boen Bruk: *See—*
Olsen, Leif T., 3,671,353.

Bogaerts, Leo C.; and Weinberger, George W., to Ammco Tools, Inc. Variable speed ratio transmission. 3,670,584, Cl. 74-199.000.

Bogri, Tibor: *See—*
Bagli, Jehan F.; and Bogri, Tibor, 3,671,570.

Bohm, Friedrich, to Metallschlauchfabrik Joseph Ulbrich & Co. Machine for the production of tubing. 3,670,544, Cl. 72-49.000.

Boileau, Jacques: *See—*
Faidutti, Michel; Boileau, Jacques; Konrat, Jean-Paul; and Billaz, Rene, 3,671,535.

Bolt, Richard Robert; and Wobbe, Delbert Edmond, to American Can Company. Drawing and ironing process. 3,670,543, Cl. 72-41.000.

Boneck, Roger L. Self-contained cable reel. 3,670,977, Cl. 242-54.00r.

Bonteil, Robert C., to Societe d'Etudes et d'Exploitation de Procedes pour l'Industrie Alimentaire Sepial. Installation for freezing a liquid or semi-liquid product. 3,670,520, Cl. 62-314.000.

Boothe, Willis A., to General Electric Company. Fluidic signal detection and prevention of stall in compressors for gas turbine engines. 3,671,134, Cl. 415-13.000.

Borden Company, The: *See—*
Hopermann, Richard Konrad, 3,671,294.

Borden, Inc.: *See—*
Pierce, Andrew Earl, 3,671,382.

Borer, Herbert W.; Cryder, John R.; and Wirtz, Edward A., to Caterpillar Tractor Co. Kickout valve and circuit. 3,670,628, Cl. 91-358.00a.

Borg-Warner Corporation: *See—*
Ball, Rowland E., 3,671,137.
Ball, Rowland E., 3,671,138.
Crowell, Jack R.; Tomashek, James R.; and Ward, Donald H., 3,670,801.
Gyory, Emeric J.; and Teichmann, Otmar E., 3,671,048.
Jones, Johnny W., 3,671,786.
Newton, Alwin B., 3,670,519.

Borger, George Frederick. Fish hook guard. 3,670,445, Cl. 43-42.400.

Bormann, Gerhard; Gmunder, John; and Wilkens, Heinrich, to Sandoz Ltd.; a/k/a and Sandoz A.G. 1,2,2a,3,4,5-Hexahydro-1-(2-imidazolin-2-ylmethyl) benz [cd] indoles. 3,671,541, Cl. 260-309.600.

Boroughs, Raymond Milton; and Redman, John Wilson, to British Petroleum Company Limited, The. Method of separation of wax from oil. 3,670,888, Cl. 210-71.000.

Borowski, Bernard J., to Ferro Corporation. Iron-containing titania-opacified porcelain enamels. 3,671,278, Cl. 106-48.000.

Borsi, Jozsef: *See—*
Toldy, Lajos; Borsi, Jozsef; Elek, Sandor; Elekes, Istvan; and Andrasi, Ferenc, 3,671,537.

Bosacco, David N. Prosthetic or fracture device and method. 3,670,724, Cl. 128-92.00d.

Bossen, Douglas C.; and Hsiao, Mu-Yue, to International Business Machines Corporation. Error correcting decoder. 3,671,947, Cl. 340-146.1al.

Bostad, Wayne W.: *See—*
Olson, John E.; Bostad, Wayne W.; and Price, Norman L., 3,670,626.

Bostedt, Jan Olof Gustaf: *See—*
Karlsson, Karl Gosta; and Bostedt, Jan Olof Gustaf, 3,671,029.

Bostrom, Sten-Lennart. Locking device using radiation conducting key. 3,671,752, Cl. 250-220.

Boucherle, Andre L.: *See—*
Carraz, Gilbert L.; and Boucherle, Andre L., 3,671,532.

Bourgeois, Norbert Paul, to Etudes et Bonneterie SA. Circular knitting-machine. 3,670,527, Cl. 66-50.00r.

Bowker, John Kent, to Itek Corporation. Interferometer of the center balance type. 3,671,130, Cl. 356-106.000.

Bowling, Harold F.; *See—*
Hall, Maurice B., 3,670,428.

Boyriven, Paul, to Compagnie Industrielle de Mecanismes. Ball or roller fastening device. 3,671,064, Cl. 292-45.000.

Bozanic, Donald A.; Mergerian, Dickron; and Minarik, Ronald W., to Westinghouse Electric Corporation. Broadband zero field exchange echo system. 3,671,855, Cl. 324-.500.

Brack, Karl, to Hercules Incorporated. Cross-linkable unsaturated polymer compositions. 3,671,475, Cl. 260-22.

Bradley, George M. Electrical fish scaler. 3,670,364, Cl. 17-66.000.

Bradshaw, Christopher Patrick Cadman: *See—*
O'Hara, Joan Irenee; and Bradshaw, Christopher Patrick Cadman, 3,671,462.

Bradshaw, Michael S. Carrier for hook type coat hanger. 3,670,937, Cl. 224-45.00t.

Brantte, Arnold; Frostling, Bengt Harald Ivar; and Lindgren, Per-Henning. Apparatus for a quantitative anaylsis of a gas or gas mixture in respect of its content of organic substances. 3,671,196, Cl. 23-254.00r.

Brazda, Ladislav, deceased (by Brazdova, Drahuska); Brazdova, Dagmar; heirs; Prochazka, Miloslav; Kuhn, Vladimir; Ozdian, Josef; and Benes, Rudolf, to Elitex, Zavody testilniho strojrenstvi. Mechanism for withdrawing and winding yarn in spinning units. 3,670,484, Cl. 57-34.00r.

Brazdova: *See—*
Brazda, Ladislav, deceased; Brazdova, Dagmar; heirs; Prochazka, Miloslav; Kuhn, Vladimir; Ozdian, Josef; and Benes, Rudolf, 3,670,484.

Brazdova, Dagmar; heirs: *See—*
Brazda, Ladislav, deceased; Brazdova, Dagmar; heirs; Prochazka, Miloslav; Kuhn, Vladimir; Ozdian, Josef; and Benes, Rudolf, 3,670,484.

Breach, Geoffrey D.: *See—*
Levy, Alan A.; Rodger, Mitchell N.; and Breach, Geoffrey D., 3,671,629.

Breiling, Hans Georg, to Dragerwerke Aktiengesellschaft. Expansion temperature sensing means, in particular for medical apparatus. 3,671,024, Cl. 261-39.00r.

Brendgord, Thomas, to American Sterilizer Company. Patient care wall. 3,670,718, Cl. 128-1.00r.

Brenner, Bruce C., to Dow Corning Corporation. Lubricant compositions. 3,671,433, Cl. 252-49.600.

Brent, Albert: *See—*
Teichmann, Charles F.; and Brent, Albert, 3,671,209.

Brepoels, Joseph Rene; and Busschots, Armand August Florent, to S.A. PRB. Plant growth regulants. 3,671,217, Cl. 71-105.000.

Bresin, Adam. Exchanger for cooling fluids. 3,670,522, Cl. 62-333.000.

Breston, Michael P.; and Keilberg, Ray D., to Fluor Corporation. Automatic submarine trencher. 3,670,514, Cl. 61-72.400.

Brien, Andre. Watch display case. 3,670,437, Cl. 40-126.00b.

Briggs & Stratton Corporation: *See—*
Harkness, Joseph R., 3,671,851.

Briggs, Albert Theodore; and Swisher, Eugene Henry, to United Engineering and Foundry Company. Holding shelf apparatus. 3,670,551, Cl. 72-252.000.

Brillion Iron Works, Inc.: *See—*
Hoyt, Charles T.; Haun, John W.; Hensel, Dwight L.; Hansen, Clarence M.; Lovely, Walter G.; and Bruhn, Hjalmar D., 3,671,077.

Briones, Robert A., to TRW Inc. Light intensity calorimeter. 3,670,570, Cl. 73-190.00r.

British Iron and Steel Research Association, The: *See—*
Reed, Geoffrey Ronald, 3,670,877.

British Petroleum Company Limited, The: *See—*
Boroughs, Raymond Milton; and Redman, John Wilson, 3,670,888.
O'Hara, Joan Irenee; and Bradshaw, Christopher Patrick Cadman, 3,671,462.

Britt, James E.; and Hewitt, Robert E., to Xerox Corporation. Development electrode. 3,670,700, Cl. 118-636.000.

Brocato, Samuel C. Dish tray. 3,670,938, Cl. 224-48.00r.

Brock, Jessie O.: *See—*
Fitzgerald, Warren E.; Knudsen, John P.; and Brock, Jessie O., 3,671,619.

Bromer, Heinz; and Meinert, Norbert, to Leitz, Ernst, G.m.b.H. Optical fluorophosphate glass having an anomalous partial dispersion ratio. 3,671,276, Cl. 106-47.00q.

Brooker Leslie G. S.: *See—*
Fumia, Arthur, Jr.; Heseltine, Donald W.; and Brooker Leslie G. S., 3,671,648.

Brooks, Frank W.; and Naismith, Thomas D., to General Motors Corporation. Disc brake with parking brake. 3,670,853, Cl. 188-72.600.

Brooks, James; Drummond, Ralph E.; Heinz, Frank J.; and Chambers, William W., to Robertshaw Controls Company. Thermostat set. 3,671,762, Cl. 307-117.000.

Brooks Products, Inc.: *See—*
Robbins, James L., 3,671,156.

Brown, Albert B.; and Parkhill, Frank J., to Rohm & Haas Company. Method of treating shaped articles with betaine-type polymers and the articles thereby obtained. 3,671,305, Cl. 117-138.80f.

Brown, Carl A.; and Walter, Frederick L., to Parker-Hannifin Corporation. Fluid filter device having bypass and indicator means. 3,670,889, Cl. 210-90.000.

Brown, Cicero C. Well packer. 3,670,815, Cl. 166-136.000.

Brown, Gerald H.; and Mazzarella, Emil D., to National Starch and Chemical Corporation. Paper surface sizing process and product utilizing cationic amylose derivatives. 3,671,310, Cl. 117-156.000.

Brown, Herbert C. Carbonylation of organoboranes. 3,671,585, Cl. 260-545.00r.

Brown, Howard W.: *See—*
Sullivan, Gene F., 3,671,015.

Brown, Joseph: *See—*
Weber, Hans B.; and Brown, Joseph, 3,670,660.

Brown, Perry H.; and Webber, Harold H., to Brunswick Corporation. Method of and apparatus for forming metal fiber textile blend and metal fiber textile product. 3,670,485, Cl. 57-50.000.

Brown, Robert J.: *See—*
Kostur, Robert E.; and Brown, Robert J., 3,671,161.

Browning, George William, to Associated Electrical Industries Limited. Film transfer mechanism for electron microscopes. 3,671,742, Cl. 250-49.0se.

Bruder, Karl. Sheet laminating machine for feeding laminated sets to a press roller. 3,671,363, Cl. 156-556.000.

Bruestle, Carl O. Wire drawing. 3,670,588, Cl. 72-289.000.

Bruhn, Hjalmar D.: *See—*
Hoyt, Charles T.; Haun, John W.; Hensel, Dwight L.; Hansen, Clarence M.; Lovely, Walter G.; and Bruhn, Hjalmar D., 3,671,077.

Brumett, Billy M.: *See—*
Welsh, Clarke T.; and Brumett, Billy M., 3,670,478.

Brungs, Charles A.: *See—*
Sabatelli, Philip M.; Loder, Edwin R.; Brungs, Charles A.; and Sarge, Carmen R., 3,671,440.

Bruniaux, Bernard Jean Pierre Louis Lucien; and Le Corre, Roger Jean, to Etat Francais-Delegation Ministeriello pour l'Armement.

Hulls of the ships and their methods of construction. 3,670,683, Cl. 114-65.00r.

Brunner, Alfred, to Sulzer Brothers, Ltd. Method for irradiating foodstuffs and other consumables, pharmaceuticals and the like, and a package for same. 3,670,874, Cl. 206-46.0pv.

Brunner, Richard G., to Allis-Chalmers Manufacturing Company. Vacuum interrupter shunted with mechanical switch. 3,671,696, Cl. 200-144.00b.

Brunner, Richard G., to Allis-Chalmers Manufacturing Company. Vacuum switch with power fuse. 3,671,907, Cl. 337-4.000.

Brunswick Corporation: *See—*
Brown, Perry H.; and Webber, Harold H., 3,670,485.
Sanders, James W., 3,671,724.

Bryant, William W.; and Groff, Richard T., to United States of America, Navy. Gun blast stripper and diffuser. 3,670,622, Cl. 89-14.00c.

Brzoska, Leonard M. Tool for applying suspension clamps to power lines. 3,670,390, Cl. 29-271.000.

Buchanan, Houston H. Compensation tool bar device. 3,670,824, Cl. 172-449.000.

Bucher, John H.; and Held, John F., to Jones & Laughlin Steel Corporation. High-strength steel having aging properties. 3,671,334, Cl. 148-12.300.

Buckeridge, Roger M., to Westinghouse Air Brake Company. Reverser protective circuit. 3,671,834, Cl. 318-293.

Buckman, John D.; Pera, John D.; and Raths, Fred W., to Buckman Laboratories, Inc. Methods of combatting bacteria and fungi using cyanoalkyl esters of 2-haloacrylic and 2,3- dihalo propionic acids. 3,671,641, Cl. 424-304.000.

Buckman Laboratories, Inc.: *See—*
Buckman, John D.; Pera, John D.; and Raths, Fred W., 3,671,641.

Bud, Hans, to English Numbering Machines Limited. Indexing mechanisms. 3,670,580, Cl. 74-815.000.

Budd Company, The: *See—*
Almond, Elmer C., 3,670,393.
Haas, Charles H., 3,670,392.
Hurlebaus, Richard P., 3,671,713.
Jahnle, Herbert A., 3,671,227.
Mattia, Michael, 3,671,405.
Mattia, Michael; and Van Sciver, Herbert D., II, 3,671,406.

Bunker-Ramo Corporation, The: *See—*
Zerlin, William Max Erich; Avery, Roger Peter; and Royce, David Hugh, 3,671,922.

Burch, Arthur R.; and Bates, Charles E., to Clark Equipment Company. Obstruction detection means for material handling device. 3,670,905, Cl. 214-16.40a.

Burgdorf, Marten: *See—*
Kienzler, Wolfgang; and Burgdorf, Marten, 3,670,554.

Burkard, Hans: *See—*
Biernath, Emil; and Burkard, Hans, 3,670,629.

Burke, Robert F.: *See—*
Mascio, Nicholas E.; and Burke, Robert F., 3,671,197.

Burleson, E Richard; and Davis, Carl H., to Dresser Industries, Inc. Package for flexible products. 3,670,880, Cl. 206-65.00s.

Burlington Industries, Inc.: *See—*
Jinnette, Allen J., 3,671,179.

Burnett, Henry J. Electric induction gas heater. 3,671,715, Cl. 219-374.000.

Burroughs Corporation: *See—*
Funk, John W.; and Lakhani, Kishor M., 3,670,647.
Kauffman, Samuel L., 3,671,919.
Kronies, Reinhard K.; and Hansen, Iver C., 3,671,940.
Maniar, Prakash N., 3,671,287.

Burroughs Wellcome Company: *See—*
Cresswell, Ronald Morton; and Mentha, John William, 3,671,564.

Burton, Paul E.: *See—*
Wiese, Herbert K.; and Burton, Paul E., 3,671,590.

Buschhoff, Max, to Schering AG. Method of making hexaorganodiplumbanes. 3,671,561, Cl. 260-437.00r.

Buschmann, Hans, to Telesco Brophey Limited. Sheath for umbrella. 3,670,749, Cl. 135-33.00c.

Bushman, Bliss M.; and Schultz, William D., to Perkins-Elmer Corporation, The. System for integrating gunsight reticle image and image received by a camera. 3,671,100, Cl. 350-19.000.

Busschots, Armand August Florent: *See—*
Brepoels, Joseph Rene; and Busschots, Armand August Florent, 3,671,217.

Buswell, Wallace H., 1/2 to Anderson, Clare E. Eccentric acting floating-controlled pinch-valve vessel filling assembly. 3,670,751, Cl. 137-1.000.

Butcher, James; Gyllstrom, Richard G.; and Lamb, William Doyle, to Cash, A. W., Valve Manufacturing Corporation. Backflow preventer. 3,670,760, Cl. 137-218.000.

Butler, Albert Q.: *See—*
Tyson, Henry K.; and Butler, Albert Q., 3,670,766.

Butterfield, Boydston Lewis, to American Cyanamid Company. Fluorescent compositions. 3,671,451, Cl. 252-301.200.

Buzzolini, Mario G.: *See—*
Griot, Rudolf G.; and Buzzolini, Mario G., 3,671,583.

Cady, Percy L., Jr., to Houdaille Industries, Inc. Method and means for punching. 3,670,610, Cl. 83-55.000.

Cahill, Robert J. Pilot pin for mounting automobile wheels. 3,670,391, Cl. 29-273.000.

Cairati, Luciano: *See—*
Calcagno, Benedetto; and Cairati, Luciano, 3,671,576.

Cairns, Walter John: *See—*
Fraser, William Milton; Cairns, Walter John; and Mac Donald, Ian Norman, 3,671,149.

Calabrese, Ronald V., to Lumenite Electronic Company. Liquid level control. 3,671,142, Cl. 417-36.000.

Calame, Jean Pierre: *See—*
Siddall, John B.; and Calame, Jean Pierre, 3,671,558.

Calcagno, Benedetto; and Cairati, Luciano, to Societa' Italiana Resine S.p.A. Process for preparing olefin esters. 3,671,576, Cl. 260-497.00a.

Calgon Corporation: *See—*
Hofer, Lawrence John Edward; and Manes, Milton, 3,670,424.

Calhoun, Donald F., to Hughes Aircraft Company. Digital binary multiplier employing sum of cross products technique. 3,670,956, Cl. 235-164.000.

Calor: *See—*
Trouilhet, Maurice Marie Achille, 3,671,357.

Campbell, Billy G. Fireplace log burner. 3,671,175, Cl. 431-328.000.

Campbell, Douglas E.; and Harris, Richard A., to Western Electric Company, Incorporated. Mask registration during continuous photoetching of strip material. 3,671,243, Cl. 96-36.200.

Campbell, Ian D.: *See—*
MacDonald, John M.; and Campbell, Ian D., 3,671,423.

Campbell, Joseph O.: *See—*
Baer, Massimo; and Campbell, Joseph O., 3,671,378.
Baer, Massimo; and Campbell, Joseph O., 3,671,384.

Campbell, Richard D.; and Campbell, Sue Green; executrix. Cuff making method. 3,670,679, Cl. 112-262.000.

Campbell Soup Company: *See—*
Vogel, Leo G., 3,670,694.

Campbell, Sue Green; executrix: *See—*
Campbell, Richard D.; and Campbell, Sue Green; executrix, 3,670,679.

Canadian Industries Limited: *See—*
McCaffrey, Francis Hamnet Garland; McIndoe, Jack Garnett; and Rigg, Herbert, 3,670,650.

Canadian Marconi Company: *See—*
Denoncourt, Gilles J.; and Nejedly, Peter T., 3,671,731.

Canadian Patents and Development Limited: *See—*
Menzies, Robert W., 3,671,789.
Porter, Andrew W.; and Sanders, John L., 3,670,790.

Canon Kabushiki Kaisha: *See—*
Goshima, Takeshi; and Imai, Nobuhiro, 3,670,992.

Caracci, Joseph R., Jr.: *See—*
Germino, Felix J.; and Caracci, Joseph R., Jr., 3,671,269.

Carbo, Jerry A.; and Grady, Dennis F., to Westinghouse Air Brake Company. Sludge retrieval apparatus for air pollution control systems. 3,670,477, Cl. 55-227.000.

Cardwell, Gilbert I., Jr., to United States of America, Air Force, mesne. D. C. converter having control transistor in blocking oscillator feedback. 3,671,773, Cl. 307-275.000.

Carlisle, Richard S. Precise depth cutter. 3,670,733, Cl. 128-305.000.

Carlson, Bernard C.; and Hutchins, Francis E., to Vanderbilt, R. T., Company, Inc. Stable aqueous anti-dandruff shampoo containing captan. 3,671,634, Cl. 424-274.

Carlson, Chesley F., Company: *See—*
Wicker, Ralph C., 3,671,131.

Carpano & Pons. SA.: *See—*
Lemery, Jean-Paul, 3,670,984.

Carraz, Gilbert L.; and Boucherle, Andre L., to Societe de Recherches Industrielles S.O.R.I. Composition and method for lowering the blood sugar content of diabetic mammals. 3,671,532, Cl. 424-305.000.

Carrier Corporation: *See—*
O'Mara, Raymond D.; and Griffin, Charles K., 3,671,136.

Carroll, Francis Emery; and Seebold, Walter Charles, to Lever Brothers Company. Halogenated phenolic germicidal compositions containing terpene color stabilizers. 3,671,630, Cl. 424-174.000.

Carroll, John Robert; Kiniry, John Michael; and Finazzo, Anthony. Auto travel trouble sign. 3,670,438, Cl. 40-129.00c.

Carter, John Henry, to Aeromarine Corporation. Winch. 3,670,589, Cl. 74-325.000.

Casavant, George D., to International Paper Company. Process of forming an electrophotographic element. 3,671,234, Cl. 96-1.800.

Casciotti, Albert: *See—*
Baker, Charles Edward, II; and Casciotti, Albert, 3,671,921.

Casco, Ernest L.: *See—*
Devereux, Robert F.; and Casco, Ernest L., 3,670,572.

Case, J. I., Company: *See—*
Dubinsky, Terence N., 3,671,155.

Case, Leslie C. Rigid polyurethane compositions with improved properties. 3,671,470, Cl. 260-2.5ap.

Cash, A. W., Valve Manufacturing Corporation: *See—*
Butcher, James; Gyllstrom, Richard G.; and Lamb, William Doyle, 3,670,760.

Cass, Robert A.: *See—*
Ray, James D.; Steingiser, Samuel; and Cass, Robert A., 3,671,411.

Cassen, Quentin C.; Luisi, James A.; and Salman, Naif D., to North American Rockwell Corporation. Read-only memory. 3,671,948, Cl. 340-173.0sp.

Castrillon, Jose P. A., to United States of America, Atomic Energy Commission. Nitriles as scintillation solvents and solutes. 3,671,455, Cl. 252-301.2sc.

Caterpillar Tractor Co.: *See—*

Borer, Herbert W.; Cryder, John R.; and Wirtz, Edward A., 3,670,628.
Wait, John D., Jr., 3,670,808.
Caterpillar Tractor Company: *See—*
Asal, Jerrold R.; and Piepho, Donald A., 3,670,825.
Cavella, James J., to Datadyne Corporation. Self-reversing ribbon drive. 3,670,981, Cl. 242-67.4.
Cavitt, Roy L.: *See—*
Miller, Richard G.; and Cavitt, Roy L., 3,671,291.
Cebal GP: *See—*
Prayer, Gerard; and Perrat, Jean-Marie, 3,670,919.
Cecere, Andrew P.: *See—*
Cohn, Eugene; Cecere, Andrew P.; and Frezza, Robert, 3,670,375.
Cekoric, Thomas, Jr.; Evans, George; and Searcy, Ronald. Polyanionic compounds in culture media. 3,671,399, Cl. 195-100.000.
Cekoric, Thomas, Jr.; and Evans, George, to Hoffmann-La Roche Inc. Bacterial controls and preparation thereof. 3,671,400, Cl. 195-100.000.
Celanese Corporation: *See—*
Jamison, Saunders E., 3,671,471.
Loft, John T.; Conciatori, Anthony B.; and Chenevey, Edward C., 3,671,491.
Stuetz, Dagobert E., 3,671,488.
Chabardes, Pierre; Gandilhon, Pierre; Grard, Charles; and Thiers, Michel, to Rhone-Poulenc S.A. Process for the preparation of aliphatic dinitriles. 3,671,569, Cl. 260-465.80d.
Chambers, William W.: *See—*
Brooks, James; Drummond, Ralph E.; Heinz, Frank J.; and Chambers, William W., 3,671,762.
Chambers, William W., to Robertshaw Controls Company. Control apparatus. 3,670,960, Cl. 236-11.000.
Charbonnages de France: *See—*
Valantin, Alfred, 3,670,627.
Charchalis, Taras I., to Bethlehem Steel Corporation. Nail separator. 3,670,884, Cl. 209-80.000.
Charleville, Joseph L.; De Tienne, Mart E.; and Lammert, Charles W., to United States of America, Air Force. Severance of polycarbonate material canopy transparency. 3,670,998, Cl. 244-121.000.
Charns, Norman, to General Motors Corporation. Heated blower motor for defrosting windows. 3,671,714, Cl. 219-203.000.
Chase-Shawmut Company, The: *See—*
Kozacka, Frederick J.; and Belcher, Richard A., 3,671,909.
Kozacka, Frederick J., 3,671,910.
Kozacka, Frederick J., 3,671,911.
Chausse, Burnette P.; and Konrad, Charles E., to General Electric Company. Induction motor speed control. 3,671,831, Cl. 318-227.000.
Chedaille, Jacques; and Koopmans, Gerben, to Midland-Ross Corporation. Multi-fuel burner. 3,671,172, Cl. 431-174.
Cheek, Edward E., to McDowell-Wellman Engineering Company. Conveyor belt structure. 3,670,870, Cl. 198-193.000.
Cheers, Ronald M., to Euclid, Inc. Vehicle suspension. 3,671,057, Cl. 280-124.00r.
Chemed Corporation: *See—*
Sabatelli, Philip M.; Loder, Edwin R.; Brungs, Charles A.; and Sarge, Carmen R., 3,671,440.
Chemiebau Dr. A. Zieren GmbH & Co. K.G.: *See—*
Gelderblom, Horst-Dieter; and Morsdorf, Manfred, 3,670,769.
Chemische Werke Huels, A.G.: *See—*
Seifert, Friedrich; and Bittscheidt, Josef, 3,671,663.
Chen, Philip L.: *See—*
Mason, Lawrence J.; Simpson, George R.; Paradysz, Louis F.; and Chen, Philip L., 3,670,633.
Chenevert, Martin E., to Esso Production Research Company. Oil recovery process. 3,670,816, Cl. 166-252.000.
Chenevey, Edward C.: *See—*
Loft, John T.; Conciatori, Anthony B.; and Chenevey, Edward C., 3,671,491.
Cherba, Samuel: *See—*
Mahon, Thomas J.; and Cherba, Samuel, 3,670,726.
Chery, Walter Valdemar. Variable speed automatic transmission. 3,670,595, Cl. 74-688.000.
Chevron Research Company: *See—*
Jaffe, Joseph; and Kittrell, James R., 3,671,425.
Stevick, Lawrence E., 3,671,547.
Cheze, Bernard J., to Portain Poclain Materiel. Telescopic jibs. 3,670,465, Cl. 52-115.
Chiang, John S. C.; and Hogya, Bernard J., to FMC Corporation. Process of etching metal with ammonium persulfate with recovery and recycling. 3,671,344, Cl. 156-19.000.
Chiba, Minoru, to Nichicon Capacitor Ltd. Semiconductive ceramic capacitor. 3,671,818, Cl. 317-230.000.
Chicago Switch, Inc.: *See—*
Farrell, Guy M., 3,671,693.
Chick, David Michael: *See—*
Draper, James Krishen; and Chick, David Michael, 3,671,779.
Chiddix, Max E.: *See—*
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Chikata, Masaru: *See—*
Oba, Harutaro; Sawazu, Toshihiko; Takeuchi, Sugio; and Chikata, Masaru, 3,670,957.
Childers, Thomas W., to Esso Production Research Company. Underwater pollution control. 3,670,814, Cl. 166-.500.
Chin, Wesley S. C.; and Yao, Kou C., said Yao assor. to said Chin. Elongated decorative plastic strip having a greenery topping simulating foliage. 3,671,367, Cl. 161-27.000.
Christensen, Donald W., to Young Radiator Company. Protection-sleeve for finned-tubes of heat-exchanger core-unit. 3,670,811, Cl. 165-144.000.
Christian, Warren E., to Norton Company. Coated abrasive cones. 3,670,463, Cl. 51-394.000.
Christie, John B., to National Cash Register Company, The. Transition code recognition system. 3,671,722, Cl. 235-61.12n.
Chugai Seiyaku Kabushiki Kaisha: *See—*
Tsuda, Minoru; Yosida, Akio; and Yuki, Takamitsu, 3,671,468.
Church, Richard D., to American Standard Linear Systems, Inc. Variable duty cycle switching circuit. 3,671,804, Cl. 315-127.000.
Ciba Limited: *See—*
Nachbur, Hermann; and Maeder, Arthur, 3,671,611.
Ciba-Geigy AG: *See—*
Artz, Klaus; Desai, Nalin Binduprasad; and Liechti, Hans Wilhelm, 3,671,177.
Froehlich, Alfred; Piller, Bernhard; and Stauner, Thomas, 3,671,253.
Ciba-Geigy Corporation: *See—*
Keenan, John Francis Edmund, 3,671,581.
Knell, Martin; and Klemchuk, Peter P., 3,671,574.
Marand, Jean, 3,670,965.
Mizzoni, Renat Herbert; and Blatter, Herbert Morton, 3,671,512.
Cilia, Paolo. Soap and container therefor. 3,671,438, Cl. 252-90.000.
Cillichemie Ernst Vogelmann: *See—*
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Citizen Watch Co., Ltd.: *See—*
Takamune, Hirotoki; and Mochizuki, Yoshifumi, 3,670,492.
Clark Equipment Company: *See—*
Burch, Arthur R.; and Bates, Charles E., 3,670,905.
Gaylor, Richard P., 3,670,631.
Reinhardt, Robert L., 3,670,822.
Williamson, William A., 3,670,838.
Clark, Hubert M., to TRW Inc. Flat side valve for pressure balanced power steering pump with improved aspirator action. 3,671,143, Cl. 417-79.000.
Clark, Marion. Internal resistance fluid clutch. 3,670,857, Cl. 192-60.000.
Clarke, Gordon J.: *See—*
Crosby, Nobel W.; Walker, Robert C.; and Clarke, Gordon J., 3,670,372.
Claussen, Robert P. Apparatus for alining asparagus spears. 3,670,792, Cl. 146-81.00a.
Clawson, Arthur R.; Davis, Neil M.; Wieder, Harry H.; and Collins, David A., to United States of America, Navy. Lamellar eutectic InSB SB films as infrared polarizers. 3,671,102, Cl. 350-147.000.
Clay, John Armstrong, to Manchester Liners Limited. Slamming indicator system for marine devices. 3,671,954, Cl. 340-240.000.
Clement, Clyde H.: *See—*
Larson, Leland B.; and Clement, Clyde H., 3,670,959.
Clifford, Daniel. Audio-visual concentration drill and puzzle process. 3,670,472, Cl. 35-8.
Clift, Charles E., to Sperry Rand Corporation. Permanent magnet detent means for a rotary solenoid. 3,671,899, Cl. 335-253.000.
Cliftronics, Inc.: *See—*
Ganowsky, Raymond J., 3,671,898.
Coast, John B., to Coast Machinery, Inc. Machine and method for folding plastic bags and the like. 3,671,033, Cl. 270-83.000.
Coast Machinery, Inc.: *See—*
Coast, John B., 3,671,033.
Coats, John H.: *See—*
Argoudelis, Alexander D.; and Coats, John H., 3,671,647.
Coats, William M. Horseshoe fastener. 3,670,619, Cl. 85-9.000.
Cobb, James W.: *See—*
Rovin, Herman; Cobb, James W.; Opuszenski, Theodore; Willard, Richard H.; Rigat, Raymond, Jr.; and Pellicano, Joseph, 3,670,675.
Cohen, Hyman L.: *See—*
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Cohn, Eugene; Cecere, Andrew P.; and Frezza, Robert, to Samcoe Holding Corporation. Apparatus and method for tenter processing of open width fabric. 3,670,375, Cl. 26-57.00a.
Coilcraft, Inc.: *See—*
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Cole, Edward L.: *See—*
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Schwager, Irving; Leak, Robert J.; and Cole, Edward L., 3,671,591.
Cole, James K.; Coonce, Carroll A.; and Post, Harold N., to United States of America, Atomic Energy Commission. Linear structure capturing and cutting apparatus. 3,670,648, Cl. 102-4.000.
Coleman Company, Inc., The: *See—*
McCain, Lawrence G., 3,671,739.
Colgan, Joseph Dennis, to American Cyanamid Company. Process for extruded catalyst and catalyst supports. 3,671,463, Cl. 252-448.000.
Colin, Pierre; and Merle, Roger, to Melle-Bezons. Process for producing polysaccharides by fermentation. 3,671,398, Cl. 195-31.00p.

Collet, Marc Norbert: *See—*
Pilato, Maurice J. M., 3,671,730
Collins and Aikman Corporation: *See—*
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Kegelman, Thomas D.; and Williams, Peter R., 3,671,957.
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Conner, Charles J., to United States of America, Agriculture. Single bath process for orange to brown mineral dyeings, with and without fungicide, using iron, manganese, and zirconium (zirc-ox process). 3,671,178, Cl. 8-52.000.
Conner, William R., Jr., to Kellwood Company. Automatic feeder for workpieces of fabric or the like. 3,670,674, Cl. 112-121.290.
Conrad, Ludas J.; and Pope, Raymond C., to Reynolds, J. R., Tobacco Company. Apparatus for separating meat and bones including bone elevator. 3,670,882, Cl. 209-2.000.
Consolidated Coal Company: *See—*
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Constantine, Nikiforos, to Minnesoto Mining and Manufacturing Company. Digital differential emission x-ray gauge. 3,671,744, Cl. 250-51.500.
Contaldo, Joseph; and Pripeton, George, to United Engineering and Foundry Company. Method and apparatus for controlling shearing of metallic workpieces. 3,670,609, Cl. 83-37.000.
Continental Can Company, Inc.: *See—*
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Keinanen, Henry J., 3,671,356.
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Sanderson, Charles L.; and Sauer, Earl S., 3,671,601.
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Cool, Terrill A., to United States of America, Navy. Apparatus for mixing gas in a fluid mixing laser. 3,671,882, Cl. 331-94.500.
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Cooper, Kenneth G.; Cooper, Herbert T.; and Rowland, Colin M. Silicone release coatings. 3,671,484, Cl. 260-33.6sb.
Cooperman, Michael, to RCA Corporation. High speed set-reset flip-flop. 3,671,768, Cl. 307-289.000.
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Corben, Leo D.; Kammerer, William T.; and Shepp, Allan, to United States of America, Air Force. Extended dynamic range photographic processing. 3,671,246, Cl. 96-66.000.
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Cordell Hubert, Sr. Wedge and support for a temporary fence. 3,670,468, Cl. 52-298.000.
Corey, Garland G.; and Weinstein, Bernard, to American Home Products Corporation. Oxygen bleach-activator systems stabilized with puffed borax. 3,671,439, Cl. 252-99.000.
Corey, Philip D., to Gates Learjet Corporation. Regulated polyphase inverter system. 3,671,846, Cl. 321-9.00a.
Corlite Corporation: *See—*
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Corning Glass Works: *See—*
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Corringer, Jean, to Esso Research and Engineering Company. High alkalinity additives for lubricating oil compositions. 3,671,430, Cl. 252-32.70e.
Corry, Stuart E. Temperature compensator for a pressure gauge. 3,670,576, Cl. 73-393.000.
Cory Corporation: *See—*
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Cory, Victor W.; Williams, Edgar E.; and Howard, Robert J., to Moorman Manufacturing Company. Hinge mechanism for a cover plate in an animal feeder. 3,670,702, Cl. 119-52.00r.
Cosp, Enrique A. Toy and delayed release propelling mechanism therefore. 3,670,453, Cl. 46-202.000.
Cossar, Bernard C.; and Reynolds, Delbert D., to Eastman Kodak Company. Photographic bleaching and antifogging agents. 3,671,259, Cl. 96-109.000.
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Gay, Frank Munro, 3,671,327.
Cover, Lloyd W., Jr.; and Webb, Charles C., to Du Pont de Nemours, E. I., and Company. Apparatus for compressing and cooling fiber batts. 3,671,365, Cl. 156-580.000.
Cox, Charles D.; and Liggett, Thomas, to United States of America, Navy. Production of small spherical particle nitrocellulose. 3,671,515, Cl. 260-223.000.
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Cropp, David I. Assembly machine. 3,670,385, Cl. 29-203.00r.
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Crowley, Richard P. Embossed plastic surface covering and method of preparing same. 3,671,283, Cl. 117-10.
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Crum, Robert L.: *See—*
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Cuculo, John Anthony, to Du Pont de Nemours, E. I., and Company. Modifying cellulosic fabric with dicarboxylic acids to impart water-dispersibility. 3,671,184, Cl. 8-120.000.
Cuevas, Ephraim A., to PPG Industries, Inc. Removal of dissolved lead from alkali metal chloride containing solutions. 3,671,187, Cl. 23-89.000.
Cunningham, Frank W. Power cutter. 3,670,412, Cl. 30-276.000.
Cunningham, Robert G.: *See—*
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Cunningham, William G. Underwater welding device. 3,671,707, Cl. 219-74.000.
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Curry, Robert E. Controllable key lock. 3,670,538, Cl. 70-271.000.
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Cutter, Robert C. Aircraft hangars. 3,670,464, Cl. 52-30.000.
Dabney, William C., to Cutter Laboratories, Inc. Apparatus for intravenous administration of a fluid from a dual-chamber flask having an internal upset-table septum normally separating two axially-inline chambers and having a pierceable end stopper. 3,670,728, Cl. 128-214.00c.
Daeuble, Manfred: *See—*
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Dahl, David A., to Teletype Corporation. Energy conserving intermittent motion device and method. 3,670,940, Cl. 226-8.000.
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Daido Metal Company Ltd.: *See—*
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Daido Seiko Kabushiki Kaisha: *See—*
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D'Angelo, Antonio Joseph, to Pennwalt Corporation. Peroxy compounds containing a haloformate group. 3,671,651, Cl. 260-463.
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Hawes, Roland J., Jr.; and Daniel, Milton P., 3,670,923.
Daniels, Hendricus Petrus Cornelis; Van Der Ven, Theodorus Johannes; and Tates, Hans Gerard Karel, to U.S. Philips Corporation. Method of connecting metal contact areas of electric components to metal conductors of flexible substrate. 3,670,394, Cl. 29-470.100.
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Date, Tasuku; and Hashimoto, Eiichi, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus and methods for controlling the amount of fuel injected into an internal combustion engine. 3,670,710, Cl. 04/13/72.
Dauben, Dwight L.; Froning, H. R.; and Jones, Loyd W., to Amoco Production Company. Process for treatment of water injection wells. 3,670,819, Cl. 166-305.00r.
David, Reginald; and Estienne, Jean, to Rhone-Poulenc S.A. Process for the preparation of carbonyl derivatives and carboxylic acids. 3,671,582, Cl. 260-533.00r.
David, Richard F.: *See—*
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Davis, Carl H.: *See—*
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Davis, Chester P., to Dow Chemical Company, The. Bag closure means. 3,670,876, Cl. 206-58.000.
Davis, John W.; and Belew, Herschel W., Jr., to United States of America, National Aeronautics and Space Administration. Altitude simulation chamber for rocket engine testing. 3,670,564, Cl. 73-117.100.
Davis, Louis E.; Jensen, Billy M.; Larson, Floyd L.; Huck, Rainer F.; and Stumph, Stephen L., to Bio-Logics, Inc. Encoding and verifying information. 3,670,386, Cl. 29-211.00r.
Davis, Neil M.: *See—*
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Dawdy, Jack A., to National Gypsum Company. Gypsum board fastener. 3,671,061, Cl. 287-20.92w.
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De More, Louis A.: *See—*
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de Ridder, Gerardus Johannes, to Ingenieurbureau de Ridder N.V. Apparatus for stacking sheets. 3,671,034, Cl. 271-68.000.
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De Tienne, Mart E.: *See—*
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De Vos, Jacques, to United States Pipe and Foundry Company. Casting process for rolls. 3,670,800, Cl. 164-95.000.
Deborde, Albert, to Ateliers Diderichs. Device for the recovery and removal of a false selvedge in a shuttleless loom. 3,670,779, Cl. 139-304.000.
Decatur Foundry & Machine Co., Inc.: *See—*
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Decker, Martin; Schmidt, Joseph; Hoffmann, Herwig; and Pistor, Hans Joachim, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of adiponitrile. 3,671,566, Cl. 260-465.200.
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Ingham, Robert M., Jr., 3,670,367.
Sink, James A., Jr.; and Watson, Richard J., 3,671,170.
Dega, Fred W., to General Motors Corporation. Fluidic system for evaluating physical characteristics. 3,670,560, Cl. 73-37.000.
Degremont, Societe Generale d'Epuration et d'Assainissement: *See—*
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Dehnhard, Willi. Chill casting machines. 3,670,803, Cl. 164-267.000.
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Delta Manufacturing and Engineering Corporation: *See—*
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Denny, John H., Jr., to General Electric Company. Amplifying circuit. 3,671,884, Cl. 332-16.00t.
Denoncourt, Gilles J.; and Nejedly, Peter T., to Canadian Marconi Company. Pythagoreas adder or solid state resolver. 3,671,731, Cl. 235-192.000.
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Devereux, Robert F.; and Casco, Ernest L., to United States of America, Navy. Air-sea interface temperature measuring apparatus. 3,670,572, Cl. 73-342.000.
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Diapulse Corporation: *See—*
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Dick, Heinrich, to Voith Getriebe KG. Electromagnet with a field-responsive control system. 3,671,814, Cl. 317-123.000.
Dierolf, Arthur Jack, to United States of America, Navy. Dense propellant composition. 3,671,341, Cl. 149-19.000.
Diery, Helmut; Kiefer, Bernhard; Rittner, Siegbert; and Seidel, Manfred, to Farbwerke Hoechst Aktiengesellschaft vormals and Meister Lucius & Bruning. Textile softening agents. 3,671,308, Cl. 117-139.0sa.
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Donahue, William J.; Blanchard, David L.; and Wack, John M., to United States of America, Navy. Fuze arming device. 3,670,656, Cl. 102-81.000.
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Kettler, Clarence J.; and Downs, Clifford L., 3,671,860.
Doyle, Brian W., to Avco Corporation. Annular combustors. 3,671,171, Cl. 431-116.000.
Doyle, George Mitchel; Humphreys, Robert Eric; and Moring, Peter Lothar Ernst, to Dunlop Holding Limited. Rubber compositions. 3,671,478, Cl. 260-23.70m.
Dragerwerke Aktiengesellschaft: *See—*
Breiling, Hans Georg, 3,671,024.
Dragisich, Myron, to Warner & Swasey Company, The. Twister device. 3,670,487, Cl. 57-77.300.
Dragisich, Myron, to Warner & Swasey Company, The. Compensator device. 3,670,978, Cl. 242-54.400.
Draper, James Krishen; and Chick, David Michael, to International Computers Limited. Field effect transistor switching arrangement for amplifying only low level signals. 3,671,779, Cl. 307-251.000.
Drapkin, William, to Slater Electric Inc. Pressure lock and release terminal for an electrical receptacle. 3,671,925, Cl. 339-95.00d.
Dresser Industries, Inc.: *See—*
Burleson, E Richard; and Davis, Carl H., 3,670,880.
Fillion, Stanley H., 3,670,662.
Nell, David J.; and Lewis, Thomas W., II, 3,671,302.
Drews, Harvey J.; and Raffensperger, Stanley P., to White Lily Foods Company, The, mesne. Packaged mixes for flavored food products and the process of making them. 3,671,264, Cl. 99-94.000.
Driscoll, Gary L., to Sun Oil Company. Unsaturated polyesters prepared from α,α, dimethyl muconic acids. 3,671,572, Cl. 160-485.00g.
Driskell, Carl R., to United States of America, Navy. Periscope stadimeter simulator with camera sweep delay. 3,671,391, Cl. 178-6.800.
Drummond, Ralph E.: *See—*
Brooks, James; Drummond, Ralph E.; Heinz, Frank J.; and Chambers, William W., 3,671,762.
Du Pont de Nemours, E. I., and Comany: *See—*
Stone, Glenn Duane, 3,671,245.
Du Pont de Nemours, E. I., and Company: *See—*
Bellis, Harold Edward, 3,671,596.
Bergna, Horacio E., 3,671,201.
Berry, Walter Cunningham, Jr., 3,671,653.
Cover, Lloyd W., Jr.; and Webb, Charles C., 3,671,365.
Cuculo, John Anthony, 3,671,184.
Evans, Evan Franklin; and Pierce, Norwin Caley, 3,671,379.
Hansen, John Edward, 3,671,381.
Howard, Edward G., Jr., 3,671,509.
Knowles, Richard N., 3,671,637.
Knowles, Richard N., 3,671,638.
Knowles, Richard N., 3,671,642.
Kwolek, Stephanie Louise, 3,671,542.
Lohr, James E., 3,671,412.
Walle, Leonard A., 3,671,293.
Dubinsky, Terence N., to Case, J. I., Company. Hydrostatic bearing. 3,671,155, Cl. 418-73.
Dubner, Harvey, to Baxter Corporation, The, mesne. Method and apparatus for producing jacquard cards. 3,671,944, Cl. 340-172.500.
Dudley, Leslie Peter, to Dudley Optical Laboratories, Inc. Methods of printing stereoscopic integral photograph from pseudoscopic original. 3,671,122, Cl. 355-22.000.
Dudley Optical Laboratories, Inc.: *See—*
Dudley, Leslie Peter, 3,671,122.
Duguay, Michel Albert, to Bell Telephone Laboratories, Incorporated. Picosecond optical apparatus utilizing optically induced birefringence in solids. 3,671,747, Cl. 250-199.000.
Duke, Bernard; and Levensohn, David Z., to Miracle Pet Products, Inc. Combination aquarium pump and gang valve. 3,671,151, Cl. 417-411.000.
Dun-Hot, Incorporated: *See—*
Jehn, David H., 3,671,270.
Dunbar, Glenn G. Container handling apparatus. 3,670,912, Cl. 214-313.000.
Duncan, Floyd R., to Pan American Petroleum Corporation. Pontoon structures in man-made lake for arctic operations. 3,670,813, Cl. 166-.500.
Dunlop Holding Limited: *See—*
Doyle, George Mitchel; Humphreys, Robert Eric; and Moring, Peter Lothar Ernst, 3,671,478.
Dura Corporation: *See—*
Aarup, Carl P., 3,671,055.
Duron, Paul P.; and Rich, Harold T., to Air Reduction Company, Incorporated. Machine for making dry ice pellets. 3,670,516, Cl. 62-35.000.
Dushkes, Sherman Z.; and Surty, Rohinton J., to International Business Machines Corporation. Miniature ultrasonic bonding device. 3,670,944, Cl. 228-1.000.
Dutcher, Daniel P., to Hoerner Waldorf Corporation. Display carton. 3,670,881, Cl. 206-45.340.
Dwyer, Howard I., Jr., to Amsted Industries Incorporated. Precompressed spring package. 3,670,873, Cl. 206-46.00h.
Dynak, Inc.: *See—*
Griswold, Augustus W., 3,670,768.
Dynamit Nobel Aktiengesellschaft: *See—*
Gawlick, Heinz; Marondel, Gunther; and Siegelin, Werner, 3,671,343.
Eastman Kodak Company: *See—*
Albert, Donald J., 3,671,121.

Andrews, Peter, 3,670,989.
Contois, Lawrence E., 3,671,233.
Cossar, Bernard C.; and Reynolds, Delbert D., 3,671,259.
Dostes, Claude Guy, 3,671,254.
Eldridge, Merle K.; Bloom, Roy C.; and Joseph, Douglas C., 3,671,248.
Fumia, Arthur, Jr.; Heseltine, Donald W.; and Brooker Leslie G. S., 3,671,648.
Gnage, Oliver W.; and Connelly, Gordon F., 3,670,868.
Gramza, Eugene P.; and Schreiber, David D., 3,671,240.
Hagemeyer, Hugh J., Jr.; and Robinson, Alfred G., III, 3,671,550.
Hagemeyer, Hugh J., Jr.; and Goss, Harry F., 3,671,603.
Houle, Conrad G.; and Masseth, Thomas J., 3,671,251.
Jackson, Winston J., Jr.; and Watson, Marshall T., 3,670,489.
Johnson, Robert B., 3,671,113.
Leutwein, Manfred; and Streicher, Heinz, 3,671,116.
Lindsay, Douglas J., 3,670,638.
Miller, Stephen H., 3,670,616.
Minsk, Louis Morton; Cohen, Hyman L.; and Frauenglass, Elliott, 3,671,256.
Oftedahl, Edwin N.; Huttemann, Thomas J., Jr.; and Goffe, Charles A., 3,671,260.
Ort, Wolfgang, 3,670,635.
Stark, Daniel J., 3,670,991.
Taber, Robert C., 3,671,258.
Whitmore, Thomas C.; and Cunningham, Robert G., 3,671,806.

Eaton, Bruce G., deceased (by First Pennsylvania Bank and Trust Co.), to Westinghouse Electric Corporation. Wiping contact reed switch. 3,671,892, Cl. 335-154.000.

Eberle, Arthur C.; and Darby, Lee H., to Columbia Gas System Service Corporation. Flame detection apparatus. 3,671,815, Cl. 317-133.500.

Echlin Manufacturing Corporation, The: *See—*
Gackstetter, Henry Clinton; Anderson, Harold Francis; Shove, Gordon William; and Morin, Louis George, 3,671,314.

Eckart, Francis H.: *See—*
Hayes, John R.; Eckart, Francis H.; and Peck, Donald E., 3,670,624.

Eckert, Clarence J.; and Moulds, John W., to General Motors Corporation. Idle air control. 3,670,709, Cl. 123-124.00r.

Eckrich, Peter, & Sons, Inc.: *See—*
Flesch, Keith E., 3,670,793.

Eclipse Consultants Limited: *See—*
Becker, John E., 3,670,498.

Ede, Ainsley Neville, to Hudswell Yates Developments Limited. Mole plough depth control mechanism. 3,670,431, Cl. 37-193.000.

Edgar, Robert F.; Martzloff, Francois D.; and Tompkins, Russell E., to General Electric Company. Magnetic latch and switch using cobalt-rare earth permanent magnets. 3,671,893, Cl. 335-179.000.

Edmisson, Russell C.: *See—*
Lemkin, Jack L.; Leistikow, Gerard K.; Edmisson, Russell C.; and Benson, John T., 3,670,449.

Edwards, William R., to United States of America, Navy. Force gaging gloves. 3,670,574, Cl. 73-379.003.

Edwards, William Thomas; and Kirwan, James, to Communications Patents Limited. Television receivers utilizing transistors connected as a Darlington pair. 3,671,799, Cl. 315-27.0td.

Eilingsfeld, Heinz: *See—*
Patsch, Manfred; and Eilingsfeld, Heinz, 3,671,536.

Eisen, Stefan F.: *See—*
Everson, Kirke B., Jr.; and Eisen, Stefan F., 3,671,013.

Eisner, Abner: *See—*
Stallings, Leon; Devine, Martin J.; Maerker, Gerhard; and Eisner, Abner, 3,671,431.

Ekdahl & Olofsson Handelsbolag: *See—*
Ekdahl, Hans; and Olofsson, Sten, 3,670,842.

Ekdahl, Hans; and Olofsson, Sten, to Ekdahl & Olofsson Handelsbolag. Loudspeakers. 3,670,842, Cl. 181-13.00b.

El-Tahry, Mahmoud S., to Blazer Corporation. Environment conditioning apparatus. 3,670,809, Cl. 165-60.

Eldridge, Merle K.; Bloom, Roy C.; and Joseph, Douglas C., to Eastman Kodak Company. Stain inhibitor in photographic paper bases. 3,671,248, Cl. 96-76.00r.

Electra Flock, Inc.: *See—*
Grewe, Josef, 3,671,373.

Electro-Mechanical Instrument Company, Inc., mesne: *See—*
Fleetman, Hobart H.; and Wohlbach, Harry E., 3,671,861.

Elek, Sandor: *See—*
Toldy, Lajos; Borsi, Jozsef; Elek, Sandor; Elekes, Istvan; and Andrasi, Ferenc, 3,671,537.

Elekes, Istvan: *See—*
Toldy, Lajos; Borsi, Jozsef; Elek, Sandor; Elekes, Istvan; and Andrasi, Ferenc, 3,671,537.

Elektra-Bregenz GmbH: *See—*
Gehrmann, Hasso, 3,670,746.

Elfving, Thore M. Thermoelectric assemblies. 3,671,326, Cl. 136-205.000.

Elitex, Zavody testilniho strojrenstvi: *See—*
Brazda, Ladislav, deceased; Brazdova, Dagmar; heirs; Prochazka, Miloslav; Kuhn, Vladimir; Ozdian, Josef; and Benes, Rudolf, 3,670,484.

Elliott, Ernest A.; Kane, John W.; and Pasen, Randolph A., to Detroit Edison Company, The. Triple arrestor mount. 3,671,002, Cl. 248-300.000.

Elliott, Perry R. Fluid mixing device. 3,671,025, Cl. 161-76.000.

Emerick, Bruce D. Indicating device for continuously indicating time to depletion of pressure tanks in use. 3,670,575, Cl. 73-388.000.

Emerson Electric Co.: *See—*
Klanatsky, John J., 3,671,879.

Emhart Corporation: *See—*
Stevenson, James F., 3,670,908.

EMI Limited: *See—*
Rand, Walter Leslie; and Simmons, John Ernest, 3,671,158.

Emoto, Kazuhiro: *See—*
Kurita, Takaji; Motoki, Masaya; Emoto, Kazuhiro; and Hojo, Katsuo, 3,671,646.

Enari, Tsutomu: *See—*
Uchida, Hiromu; Umezono, Akimi; Saito, Takao; and Enari, Tsutomu, 3,671,205.

Encke, Frederick Ludwig: *See—*
Sheers, Edward Helmut; and Encke, Frederick Ludwig, 3,671,461.

Energy Systems, Inc.: *See—*
Woodbridge, David D.; and Mann, Leland A., 3,671,741.

Engel, Herbert; Hartwig, Karl; and Schnall, Gunther, to Agfa-Gevaert Aktiengesellschaft. Electrostatic copying apparatus. 3,671,119, Cl. 355-3.000.

Engelbart, Wilhelm, to Rheem International Inc. Pressing machine for garments. 3,670,432, Cl. 38-22.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Weir, Samuel R., 3,670,883.

Engler, Louis C. Gate placer for levee. 3,670,508, Cl. 61-63.000.

English Calico Limited: *See—*
Kemsey-Bourne, Kenneth, 3,671,348.

English Numbering Machines Limited: *See—*
Bud, Hans, 3,670,580.

Entschel, Roland: *See—*
Altermatt, Rudolf; Entschel, Roland; and Mueller, Curt, 3,671,529.

Environetics, Inc.: *See—*
Papp, Josef, 3,670,494.

Erb, Gilbert E., to Ati, Inc. Non-contacting optical probe. 3,671,126, Cl. 356-4.000.

Eriksson, Hanslivar: *See—*
Jakobsen, Kjell Moswoll; and Eriksson, Hanslivar, 3,671,386.

Esposito, John J., to United States of America, Navy. Garment cooling system. 3,670,518, Cl. 62-167.000.

Esposito, John J., to United States of America, Navy. Self-heated protective garment. 3,670,716, Cl. 126-204.000.

Esquire, Inc.: *See—*
Mosier, Benjamin, 3,671,333.

Essex International, Inc.: *See—*
Vogel, Ralph A.; and Moss, Harold S., 3,670,799.

Esso Production Research Company: *See—*
Chenevert, Martin E., 3,670,816.
Childers, Thomas W., 3,670,814.
Lloyd, James R., 3,670,515.
Matthews, Jamie F., Jr., 3,670,513.

Esso Research and Engineering Company: *See—*
Corringer, Jean, 3,671,430.
Fihn, Kurt W., 3,670,643.
Guerre, Robert P.; and Ruland, Ross R., 3,671,173.
Iarossi, Frank J., 3,671,315.
Kroll, Wolfram R., 3,671,597.
MacDonald, John M.; and Campbell, Ian D., 3,671,423.
Metro, Stephen J.; and Shaub, Harold, 3,671,434.
Saxton, Arthur L., 3,671,424.
Wiese, Herbert K.; and Burton, Paul E., 3,671,590.

Esterhoy, Charles J., Jr.; Hunter, William D., Jr.; to Allied Chemical Corporation. Concentration of wet-process phosphoric acid. 3,671,202, Cl. 23-307.000.

Estienne, Jean: *See—*
David, Reginald; and Estienne, Jean, 3,671,582.

Etablissements Carpano & Pons: *See—*
Lemery, Jean-Paul, 3,670,855.

Etablissements Pompes Guinard: *See—*
Guinard, Paul Andre, 3,671,152.

Etat Francais, represente par le Ministre des Armees Delegation Ministerielle pour l'Armement Direction des Poudres: *See—*
Faidutti, Michel; Boileau, Jacques; Konrat, Jean-Paul; and Billaz, Rene, 3,671,535.

Etat Francais-Delegation Ministeriello pour l'Armement: *See—*
Bruniaux, Bernard Jean Pierre Louis Lucien; and Le Corre, Roger Jean, 3,670,683.

Ethyl Corporation: *See—*
Berry, Currie B., Jr., 3,671,221.
Leventhal, Howard L., 3,670,953.
Leventhal, Howard L., 3,670,954.

Ettlinger, Ralph, Jr.; and Strobl, Frederick P., Jr., to Avant Industries, Inc. Silverware loading apparatus. 3,670,911, Cl. 214-312.000.

Etudes et Bonneterie SA: *See—*
Bourgeois, Norbert Paul, 3,670,527.

Euclid, Inc.: *See—*
Cheers, Ronald M., 3,671,057.

Euling, Raymond: *See—*
Biernson, George; Euling, Raymond; and Jones, Paul W., 3,671,107.

Evans, Evan Franklin; and Pierce, Norwin Caley, to Du Pont de Nemours, E. I., and Company. Composite polyester textile fibers. 3,671,379, Cl. 161-173.000.

Evans, George: *See—*
Cekoric, Thomas, Jr.; Evans, George; and Searcy, Ronald, 3,671,399.
Cekoric, Thomas, Jr.; and Evans, George, 3,671,400.

Evans, Robert W., to United States of America, Navy, mesne. Signal flare. 3,670,657, Cl. 102-87.000.

Everson, Kirke B., Jr.; and Eisen, Stefan F. Aircraft hangaring support. 3,671,013, Cl. 254-8.

Evinrude, Ralph S., to Outboard Marine Corporation. Convertible golf car. 3,671,071, Cl. 296-69.000.

Excentra Gesellschaft mit beschrankter Haftung: *See—*
Biernath, Emil; and Burkard, Hans, 3,670,629.

Extel Corporation: *See—*
Zenner, Walter J.; and Kranz, Raymond E., 3,670,861.

Eyges, Leonard. Fireplace grate. 3,670,714, Cl. 126-165.000.

Eyre, Brian; and Bland, John, to Padley & Venables Limited and McAlpin, Robert, Sir, & Sons Limited. Cutter picks. 3,671,075, Cl. 299-79.000.

Ezaki, Joichiro, to TDK Electronics Company, Limited. Diode matrix card. 3,671,811, Cl. 317-101.00d.

Ezekiel, Herbert M., to United States of America, Air Force. Method of stabilizing acrylic polymer fibers prior to graphitization. 3,671,192, Cl. 23-209.100.

Fabbro, Dario: *See—*
Lo Monaco, Sergio; Guerrato, Alfredo; Fabbro, Dario; and Donadello, Graziello, 3,671,493.

Facha, Joseph V.: *See—*
Bernath, Louis; and Facha, Joseph V., 3,671,394.

Fahey, Darryl R., to Phillips Petroleum Company. Manufacture of palladium or platinum-containing compounds. 3,671,560, Cl. 260-429.00r.

Fahlin, James R.; and Hagfors, Gerald D., to Graco Inc. Sanitary spray gun. 3,670,967, Cl. 239-412.000.

Faidutti, Michel; Boileau, Jacques; Konrat, Jean-Paul; and Billaz, Rene, to Etat Francais, represente par le Ministre des Armees Delegation Ministerielle pour l'Armement Direction des Poudres. 4-Imino-oxazolidin-2-ones and process of preparation. 3,671,535, Cl. 260-307.00c.

Falay, Bernard; and Froumajou, Armand, to Automobiles Peugeot and Regie Nationale des Usines Renault. Speed variator with friction elements. 3,670,586, Cl. 74-199.000.

Falcon Safety Products, Inc.: *See—*
Pappas, Michael, 3,670,689.

Fales, Douglas I., to General Motors Corporation. Multiple indicating telltales having sequential indications. 3,671,962, Cl. 340-373.000.

Falk, David O.: *See—*
Norton, Charles J.; and Falk, David O., 3,670,820.

Falvo, Vincent G., to McGraw-Edison Company. Disconnect switch. 3,671,689, Cl. 200-48.00a.

Falxa, Martin L.: *See—*
Samour, Carlos M.; and Falxa, Martin L., 3,671,502.

Fantuzzo, Joseph; and Punnett, Frazer D., to Xerox Corporation. Apparatus for creating duplex reproductions. 3,671,118, Cl. 355-3.000.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Kunzel, Hans-Egon; Wolf, Gerhard Dieter; Blankenstein, Gunter; and Nischk, Gunther, 3,671,614.
Schubart, Rudiger; Roos, Ernst; and Abele, Manfred, 3,671,503.
Westphal, Kurt; Meiser, Werner; Fue, Ludwig; and Hack, Helmuth, 3,671,523.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Papenfuss, Theodor; and Spietschka, Ernst, 3,671,553.
Diery, Helmut; Kiefer, Bernhard; Rittner, Siegbert; and Seidel, Manfred, 3,671,308.

Bruning: *See—*
Feess, Erich; and Ong, Sienling, 3,671,181.

Farkas, Robert D. Supply reel for banding apparatus. 3,670,986, Cl. 242-107.100.

Farley, Vincent P.: *See—*
Herman, Bernard B.; and Farley, Vincent P., 3,671,321.

Farley, Vincent P., Jr.: *See—*
Herman, Bernard B.; and Farley, Vincent P., Jr., 3,671,320.

Farrell, Guy M., to Chicago Switch, Inc. Rocker switch. 3,671,693, Cl. 200-67.00g.

Faure, Robert, to ACME Maschinenfabrik GmbH. Programmed contouring machine for machining, by tool heads, irregularly shaped work pieces. 3,670,458, Cl. 04/12/72.

Faurholdt, Bent. Incinerator for the combustion of waste products, particularly plastic materials. 3,670,667, Cl. 110-8.00a.

Favors, Hollice A. Broadband composite filter circuit. 3,671,889, Cl. 333-76.000.

Federal-Mogul Corporation: *See—*
Smythe, John W.; and Karp, Philip I., 3,671,230.

Federline, Richard G., 1/2 to Webb, Don Eugene. Alarm holder for fishing rods. 3,670,443, Cl. 43-17.000.

Feess, Erich; and Ong, Sienling, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the production of prints and pad-dyeings fast to rubbing without requiring an after-treatment on nitrogen-containing fibrous materials. 3,671,181, Cl. 8-165.000.

Felger, Carl B., to Gillette Company, The. Inhibiting dental plaque. 3,671,626, Cl. 424-49.

Fell, Ferol S.: *See—*
Long, William D.; Fell, Ferol S.; and Wells, Bernard L., 3,670,590.

Ferag AG: *See—*
Reist, Walter, 3,671,035.

Ferber, Martin Emile; and Wintenberger, Michel Georges, to Compagnie Pechiney. Process for purification of metals. 3,671,229, Cl. 75-211.000.

Fernandez, J. De Jesus. Door lock. 3,670,540, Cl. 70-421.000.

Fernandez, Jaime B.; and Ayers, James E., to Dow Chemical Company, The. Coreacted salts of polychlorocarboxylic acids. 3,671,652, Cl. 260-539.

Ferro Corporation: *See—*
Borowski, Bernard J., 3,671,278.

Fiber Controls Corporation: *See—*
Wise, Cecil S., 3,671,078.

Field Queen Incorporated: *See—*
Long, William D.; Fell, Ferol S.; and Wells, Bernard L., 3,670,590.

Fields, Richard W.: *See—*
Bellsmith, Travis L.; and Fields, Richard W., 3,671,215.

Figas, Vincent J.: *See—*
Pierno, Michael C.; and Figas, Vincent J., 3,670,762.

Fihn, Kurt W., to Esso Research and Engineering Company. Method for treatment of discharged solids from a liquid stream. 3,670,643, Cl. 100-37.000.

Filipak, Edmund H. Dispenser for clothes washing additives. 3,670,530, Cl. 68-17.00a.

Fillion, Stanley H., to Dresser Industries, Inc. Car body bolster center plate assembly. 3,670,662, Cl. 105-199.00c.

Finazzo, Anthony: *See—*
Carroll, John Robert; Kiniry, John Michael; and Finazzo, Anthony, 3,670,438.

Finch, Dan M. Light control material. 3,671,101, Cl. 350-109.

Findley, Anthony W.; and Rogers, Jesse M., to Anchor-Wate Company. Coating apparatus for tubular objects. 3,670,696, Cl. 118-320.000.

Firestone, Max. Crossbow cocking device. 3,670,711, Cl. 124-25.000.

Firey, Joseph C. Engine exhaust gas separating devices. 3,670,502, Cl. 60-324.000.

Firma Borsig GmbH: *See—*
Luck, Friedrich, 3,671,153.

Firma Wankel GmbH, and: *See—*
Luck, Friedrich, 3,671,153.

First Pennsylvania Bank and Trust: *See—*
Eaton, Bruce G., deceased, 3,671,892.

Fischell, Robert E., to United States of America, Navy, mesne. Surface with low absorptivity to emissivity ratio. 3,671,286, Cl. 117-333.000.

Fischer, Adolf: *See—*
Koenig, Karl-Heinz; Steinbrunn, Gustav; Windel, Hermann; and Fischer, Adolf, 3,671,571.
Zschocke, Albrecht; Rohr, Wolfgang; and Fischer, Adolf, 3,671,540.

Fischer, Adolf; Koenig, Karl-Heinz; Steinbrunn, Gustav; and Zschocke, Albrecht, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. N-Phenyl-N'-ester urea derivatives. 3,671,586, Cl. 260-545.00r.

Fischer, Georg, Aktiengesellschaft: *See—*
Marzy, Otto, 3,670,608.

Fisher, Sidney L., to Spider Staging, Inc. Suspended staging type welding machine. 3,671,712, Cl. 219-125.00r.

Fisons Pharmaceuticals Limited: *See—*
Altounyan, Roger Edward, 3,671,625.

Fitzgerald, Warren E.; Knudsen, John P.; and Brock, Jessie O., to Monsanto Company. Crimp reservation process. 3,671,619, Cl. 264-168.000.

Fives Lille-Cail: *See—*
Lucas, Robert, 3,670,973.

Fleetman, Hobart H.; and Wohlbach, Harry E., to Electro-Mechanical Instrument Company, Inc., mesne. Calibration device for electric meter including a control magnet mounted on a flexible arm. 3,671,861, Cl. 324-146.000.

Flesch, Keith E., to Eckrich, Peter, & Sons, Inc. Weight controlled slicing system including variable synchronization control. 3,670,793, Cl. 146-94.00r.

Flo-Tech Corporation, mesne: *See—*
Rosenberg, Karl Moses, 3,671,288.

Fluchter, Werner: *See—*
Thies, Alfred F. B.; Ameling, Bernhard; Reuther, Albert R.; and Fluchter, Werner, 3,670,531.

Fluhr, Frederick R., to United States of America, Navy. Multiple target separator. 3,671,966, Cl. 343-6.50r.

Fluor Corporation: *See—*
Breston, Michael P.; and Keilberg, Ray D., 3,670,514.
Gibson, Robert G.; Mackin, John G., Jr.; Johnson, Paul K.; and Koop, Francis D., Jr., 3,670,511.

Flynn, Thomas E. Photosensitive cuprous nitrate compositions and process for preparing and using same. 3,671,249, Cl. 96-88.000.

FMC Corporation: *See—*
Chiang, John S. C.; and Hogya, Bernard J., 3,671,344.
Traube, Robert J., 3,670,867.

Fogt, Thomas H.; Steiner, William R.; and Murphy, John M., to General Motors Corporation. Flexible plastic ice tray and storage container. 3,670,523, Cl. 62-344.000.

Foley, Alan J.; and Gardner, Madison J., to Ormet Corporation. Interlocking ingot. 3,671,204, Cl. 29-187.000.

Foley, Richard G.; and Murray, James E., to Harris-Intertype Corporation. Direction reversing control for a machine control system. 3,671,827, Cl. 318-162.000.

Fonden, Per Borje; and Walander, Karl Ove Torgny. Aircraft arresting device. 3,670,997, Cl. 244-110.00c.

Food Equipment, Inc.: *See—*
Dillon, Janus J., 3,670,365.

Foote Mineral Company: *See—*
Smith, William Novis, Jr., 3,671,605.

Ford Motor Company: *See—*
Gebhard, Harold C.; and Schueren, William B., 3,670,454.
Jania, Zbigniew J.; and Vanderberg, Lawrence J., 3,671,081.
Ojala, William K., 3,670,708.

Forman, William E. Multi-purpose stopper. 3,670,915, Cl. 215-48.000.

Forter, Willy; Henrard, Armand; Kehrer, Fritz; Keller, Urs Martin; and Wasem, Hans, to Sandoz Ltd. Phenyl-azo-naphthol compounds of low solubility. 3,671,514, Cl. 260-203.

Foss, Richard L.: *See—*
Winter, Henry A., Jr.; Williams, Arthur M., Jr.; and Foss, Richard L., 3,670,831.

Fouquart, John, to Photosystems Corporation. Three dimensional and/or time sequence X-ray apparatus. 3,671,745, Cl. 250-61.000.

Fournier, Eugene. Filter having a flexible wall for filtering liquids. 3,670,898, Cl. 210-356.000.

Fowke, Ronald T.: *See—*
Hokanson, Lyle W., and; and Fowke, Ronald T., 3,670,827.

Frank, Bruce S. Desalination of sea water. 3,670,897, Cl. 210-321.000.

Frans, Robert D., to Hanna Mining Company, The. Heat processing of minerals. 3,671,027, Cl. 263-32.00r.

Fraser, William Milton; Cairns, Walter John; and Mac Donald, Ian Norman, to Howden, James, & Company Limited. Cooling-gas circulators for nuclear-power stations. 3,671,149, Cl. 417-360.

Frauenglass, Elliott: *See—*
Minsk, Louis Morton; Cohen, Hyman L.; and Frauenglass, Elliott, 3,671,256.

Fredericks, Carl K., to Corlite Corporation. Method of fabricating structural members. 3,670,555, Cl. 72-370.000.

Frederiksen, Thomas M., to Motorola, Inc. Temperature compensated bias circuit. 3,671,770, Cl. 307-310.000.

Freeman, Peter A. Vacuum controlled fluidic regulator. 3,670,754, Cl. 137-81.500.

Fregeolle, Oscar, to Pilot Research Corporation. Apparatus and method for slitting fabric on a circular knitting machine. 3,670,528, Cl. 66-147.000.

Fregeolle, Oscar, to Pilot Research Corporation. Seamless panty hose and method. 3,670,529, Cl. 66-177.000.

French, Gerald H., to Mosley Electronics Company. Selectively-polarized antenna employing impedance matched crossed dipoles. 3,671,973, Cl. 343-751.000.

French, Thomas, &-Sons Limited: *See—*
Wood, William, 3,670,780.

French, William E.: *See—*
Day, Richard A.; and French, William E., 3,671,728.

Frezza, Robert: *See—*
Cohn, Eugene; Cecere, Andrew P.; and Frezza, Robert, 3,670,375.

Friedl, Edward L. Ground surface drainage apparatus. 3,670,894, Cl. 210-164.000.

Friedman, David, to Computervision Corporation. Method and apparatus for positioner calibration system. 3,671,748, Cl. 250-201.000.

Fries, James R., to Boeing Company, The. Multiple antenna instrument landing system. 3,671,967, Cl. 343-108.00r.

Frink, Richard C.: *See—*
Knudson, Louis I.; Frink, Richard C.; and White, Charles H., 3,671,788.

Fritz Gegauf AG: *See—*
Ueltschi, Odette, 3,670,974.

Froehlich, Alfred; Piller, Bernhard; and Stauner, Thomas, to Ciba-Geigy AG. Photographic light-sensitive material especially for the silver-dyestuff bleaching process. 3,671,253, Cl. 96-99.000.

Fromell, Rolf Ivar. Variable hexagon spanner. 3,670,604, Cl. 81-98.000.

Froning, H. R.: *See—*
Dauben, Dwight L.; Froning, H. R.; and Jones, Loyd W., 3,670,819.

Frostling, Bengt Harald Ivar: *See—*
Brantte, Arnold; Frostling, Bengt Harald Ivar; and Lindgren, Per-Henning, 3,671,196.

Froumajou, Armand: *See—*
Falay, Bernard; and Froumajou, Armand, 3,670,586.

Fruehauf Corporation: *See—*
Martin, John Frank; and Ramsden, Charles Dean, 3,671,069.

Fuchs, Richard C.; Sukow, Daniel L.; and Wilke, Dennis P., to Oster Corporation. Electric vibratory massager. 3,671,785, Cl. 310-50.000.

Fudemoto, Isao; Yoshibayashi, Tsutomu; and Miyamura, Tadao, to Fujitsu Limited. Method and apparatus for automatic gain control. 3,671,886, Cl. 333-18.000.

Fue, Ludwig: *See—*
Westphal, Kurt; Meiser, Werner; Fue, Ludwig; and Hack, Helmuth, 3,671,523.

Fuji Denki Seizo Kabushiki Kaisha: *See—*
Nitta, Yoshio, 3,671,688.

Fuji Iron & Steel Co., Ltd.: *See—*
Uchida, Hiromu; Umezono, Akimi; Saito, Takao; and Enari, Tsutomu, 3,671,205.

Fuji Photo Film Co., Ltd.: *See—*
Yoneyama, Masakazu; Shimamura, Isao; Iwano, Haruhiko; and Ohi, Reiichi, 3,671,247.

Fujii, Akihiro, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing a semiconductor photosensitive device. 3,671,338, Cl. 148-175.000.

Fujii, Kiyoshi: *See—*
Funakoshi, Yoshiro; Kajiura, Takehiko; Fujii, Kiyoshi; Kanamaru, Toshihiko; Nishitani, Masaki; and Komeda, Hiromu, 3,671,296.

Fujii, Tatsuo: *See—*
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Fujimoto, Keimei: *See—*
Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yositosi; and Fujimoto, Keimei, 3,671,548.

Fujimoto, Yasuo; Nagaoka, Koichi; Tatsukawa, Keizo; and Koiwa, Yoichi, to Kyowa Hakko Kogyo Co., Ltd. Polymer solutions of polyamino acids and the process for their preparation. 3,671,482, Cl. 260-30.40n.

Fujisawa, Hideya, to Nippondenso Kabushiki Kaisha. Fuel injection control system for internal combustion engines. 3,670,706, Cl. 123-32.0ea.

Fujisawa, Kiyoshi: *See—*
Yasui, Koichi; Yamamoto, Kazuo; Itami, Kazuo; Fujisawa, Kiyoshi; and Saskai, Toshio, 3,671,279.

Fujitsu Limited: *See—*
Fudemoto, Isao; Yoshibayashi, Tsutomu; and Miyamura, Tadao, 3,671,886.

Fukabori, Kentaro: *See—*
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Fukami, Masaharu; and Mori, Toshiyuki, to Olympus Optical Co., Ltd. Endoscope. 3,670,721, Cl. 128-6.000.

Fukuda, Hideo; Suzuki, Takashi; Sumino, Yasuhiro; and Akiyama, Shunichi, to Takeda Chemical Industries, Ltd. Method for producing citric acid. 3,671,395, Cl. 195-28.00r.

Fukuoka, Tatsuo. Injection molding method for sandals. 3,671,621, Cl. 264-244.000.

Fukushima, Takaaki; Takizawa, Haruki; Hori, Kikuo; Sato, Yoshito; and Mizumori, Haruhiko, to Teijin Limited. Method of drawing and heat treating synthetic filaments. 3,671,623, Cl. 264-290.000.

Fumia, Arthur, Jr.; Heseltine, Donald W.; and Brooker Leslie G. S., to Eastman Kodak Company. Carbocyanine filter dyes and sensitizers for silver halide emulsions. 3,671,648, Cl. 260-240.00r.

Funakoshi, Yoshiro; Kajiura, Takehiko; Fujii, Kiyoshi; Kanamaru, Toshihiko; Nishitani, Masaki; and Komeda, Hiromu, to Takeda Chemical Industries, Ltd. Process for coating granular materials. 3,671,296, Cl. 117-100.00b.

Funk, John W.; and Lakhani, Kishor M., to Burroughs Corporation. Method of damping rebound of print hammer. 3,670,647, Cl. 101-426.000.

Furstenberger, Jean; Lebrun, Guy; and Girault, Denis, to Societe Alsacienne de Constructions Atomiques, and de Telecommunications et d'Electronique Calcatel. Mobile assembly for the installation of conduits by welding successive tubular elements. 3,670,945, Cl. 228-4.000.

G. D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli: *See—*
Seragnoli, Ariosto, 3,670,475.

Gackstetter, Henry Clinton; Anderson, Harold Francis; Shove, Gordon William; and Morin, Louis George, to Echlin Manufacturing Corporation, The. Tungsten electrical switching contacts. 3,671,314, Cl. 117-213.000.

GAF Corporation: *See—*
Doss, Nagib A., 3,671,281.

Galanes, Hector J., to International Paper Company. Collapsible carton. 3,670,949, Cl. 229-39.00r.

Galanty, Harold E. Chopping machine. 3,671,090, Cl. 308-36.100.

Galbarini, Maso; and Ramusino, Francesco Cotta, to Innocenti Societa Generale per l'Industria Metallurgica and e Meccanica. Balance compensated machine tools. 3,671,133, Cl. 408-235.000.

Galeano, Sergio F., to Owens-Illinois, Inc. System and process for recovery of cellulosic fibrous material from refuse. 3,670,968, Cl. 241-21.000.

Gandelman, Morris D., to Pale Corporation. Bracelet connector. 3,670,373, Cl. 24-265.0sh.

Gandilhon, Pierre: *See—*
Chabardes, Pierre; Gandilhon, Pierre; Grard, Charles; and Thiers, Michel, 3,671,569.

Ganowsky, Raymond J., to Cliftronics, Inc. Rotary solenoid. 3,671,898, Cl. 335-228.000.

Gantt, Wayne Carlton: *See—*
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Garber, Alexander. Golf course. 3,671,042, Cl. 273-176.0ab.

Gardner, Madison J.: *See—*
Foley, Alan J.; and Gardner, Madison J., 3,671,204.

Gardner-Denver Company: *See—*
Hanson, Laurence B.; and Arthur, Wallace W., 3,670,826.

Garland, Carl C., to Parke, Davis & Company. Rectifying means. 3,670,865, Cl. 198-33.0aa.

Gates Learjet Corporation: *See—*
Corey, Philip D., 3,671,846.

Gates, Louis E., Jr.; and Lent, William E., to Hughes Aircraft Company. Lossy dielectric structure for dissipating electrical microwave energy. 3,671,275, Cl. 106-44.000.

Gatsis, John G., to Universal Oil Products Company. Coal liquefaction process using ash as a catalyst. 3,671,418, Cl. 208-10.000.

Gattus, Jean; and Mallet, Maurice, to Rhone-Poulenc S.A. Trimellamide-imides solutions. 3,671,481; Cl. 260-30.20r.
Gaudard, Yves, to Societe Rhodiaceta. Process for stabilizing soils. 3,670,506, Cl. 61-35.000.
Gavrun, Michael T., to Curtiss-Wright Corporation. Method of manufacture of an oil seal ring having dual scrapper elements for rotary piston mechanisms. 3,670,383, Cl. 29-156.600.
Gawlick, Heinz; Marondel, Gunther; and Siegelin, Werner, to Dynamit Nobel Aktiengesellschaft. Composition for explosives comprising an alloy of magnesium and cerium. 3,671,343, Cl. 149-37.000.
Gay, Frank Munro, to Cossor, A. C., Limited. Multi-junction thermocouples. 3,671,327, Cl. 136-225.000.
Gaylor, Richard P., to Clark Equipment Company. Rotating vibrator. 3,670,631, Cl. 94-50.00v.
Gaylord, John F., Jr., to Medical Specialties, Inc. Protective pad. 3,670,725, Cl. 128-149.000.
Gebhard, Harold C.; and Schueren, William B., to Ford Motor Company. Vertical drop vent window system. 3,670,454, Cl. 49-103.000.
Geffken, John H., to Westinghouse Electric Corporation. Method and control system for D.C. electric motor drive means. 3,671,828, Cl. 318-164.000.
Gehrmann, Hasso, to Elektra-Bregenz GmbH. Combination dishwashing machine and oven. 3,670,746, Cl. 134-107.000.
Gelderblom, Horst-Dieter; and Morsdorf, Manfred, to Chemiebau Dr. A. Zieren GmbH & Co. K.G. Apparatus for the continuous adjustment of the reflux ratio of a distillation column. 3,670,769, Cl. 137-610.000.
General Anilin & Film Corporation: *See—*
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General Electric Company: *See—*
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General Motors Corporation: *See—*
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General Tire Extinguisher Corporation: *See—*
Magdars, John T., 3,670,763.
Gentile, Anthony L.; and Stafsudd, Oscar M., to Hughes Aircraft Company. Method and apparatus for Czochralski growth of large crystals. 3,671,203, Cl. 23-315.000.
Genzel, Hans-Ulrich Werner; Hafeli, Hans-Rudolf; and Steiner, Hans Robert, to Zellweger Ltd. Method and apparatus for identifying articles and identification sign therefor. 3,671,718, Cl. 235-61.11e.
Geo Space Corporation: *See—*
Gundlach, William J., 3,670,840.
George, Billy, to Textron, Inc. Method of forming trim member. 3,670,399, Cl. 29-509.000.
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Kim, Chung Sul Youn, 3,671,428.
Gerhard, Otto. Shock absorbing vehicle. 3,671,068, Cl. 293-1.000.
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Germino, Felix J.; and Caracci, Joseph R., Jr., to CPC International Inc. Process of preparing pudding containing starch having a low bound-fat content. 3,671,269, Cl. 99-139.000.
Gertsman, Lev Alexandrovich: *See—*
Abardovsky, Isaak Pavlovich; and Gertsman, Lev Alexandrovich, 3,671,387.
Gettinger, John F. Adjustable holding device. 3,671,032, Cl. 269-72.000.
Gibson, Robert G.; Mackin, John G., Jr.; Johnson, Paul K.; and Koop, Francis D., Jr., to Fluor Corporation. Rigid stinger with adjustable pipeline curvature means. 3,670,511, Cl. 61-72.300.
Gibson, Rodney William, to U.S. Philips Corporation. Delay line. 3,671,887, Cl. 333-30.000.
Gidge, Lester, to Monsanto Company. Heat sealing of porous materials. 3,671,709, Cl. 219-10.530.
Gilchrist, Allan E., to SCM Corporation. Surfacer treating process for blemished electrocoat substrates and surfacer composition therefor. 3,671,464, Cl. 252-511.000.
Gillette Company, The: *See—*
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Gilmore, John W. Bag lock assembly. 3,671,066, Cl. 292-228.000.
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Gnage, Oliver W.; and Connelly, Gordon F., to Eastman Kodak Company. Magnetic conveyor system. 3,670,868, Cl. 198-41.000.
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Goffe, William L., to Xerox Corporation. Method of making an imaging member. 3,671,282, Cl. 117-16.000.
Goldberg, Jack, to Monsanto Company. High, low and thermocouple burn-out alarm system. 3,671,953, Cl. 340-227.00r.
Goldstick, Robert Jay, to Amchem Products, Inc. Manufacturing process for esters of dihalohydroxybenzonitriles. 3,671,556, Cl. 260-404.000.
Golner, Jerold Julius: *See—*
Venuti, Richard Joseph; Golner, Jerold Julius; and D'Amato, Anthony Salvatore, 3,670,952.
Goodbody, Richard L., to United States of America, Navy. HF superstructure discone antenna. 3,671,971, Cl. 343-710.000.

Gooding, Chester Martin; Parker, Wilbur; and Melnick, Daniel, to CPC International Inc. Peanut butter. 3,671,267, Cl. 99-128.000.

Goodpasture, Kenneth Wayne. Fluid flow control apparatus for filter units in a filtration system. 3,670,895, Cl. 210-167.000.

Goodwill Automated Devices, Inc.: *See*—
Goodwill, John T., 3,670,783.

Goodwill, John T., to Goodwill Automated Devices, Inc. Cable tying machine. 3,670,783, Cl. 140-93.00r.

Goodwin, Charles M. Clip board with pencil holder. 3,670,370, Cl. 24-67.700.

Goodyear Aerospace Corporation: *See*—
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Gorin, Everett, to Consolidated Coal Company. Method of calcining and desulfurizing carbonaceous contiguous bed of agglomerates with particulate heat carriers. 3,671,401, Cl. 201-12.000.

Goshima, Takeshi; and Imai, Nobuhiro, to Canon Kabushiki Kaisha. Reel brake device for tape recorder. 3,670,992, Cl. 242-204.000.

Goss, Harry F.: *See*—
Hagemeyer, Hugh J., Jr.; and Goss, Harry F., 3,671,603.

Gotshall, William W., to Marathon Oil Company. Pelleting of oil-coated carbon particles. 3,671,613, Cl. 264-115.000.

Gottlob, Heinrich: *See*—
Behn, Reinhard; Gottlob, Heinrich; Haid, Hans; Hoyler, Gerhard; and Kessler, Hartmut, 3,670,378.

Gotz, Hans, to Daimler-Benz Aktiengesellschaft. Roof top for motor vehicles. 3,670,640, Cl. 98-2.180.

Gouger, Leonard Joseph: *See*—
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Gould, Bruce Michael, 'Automatic' Sprinkler Corporation of America. Apparatus and process for treating hides. 3,670,534, Cl. 69-30.000.

Grace, W. R., & Co.: *See*—
Maher, Philip Kenerick; Albers, Edwin Wolf; and McDaniel, Carl Vance, 3,671,191.
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Grady, Dennis F.: *See*—
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Grafstein, Danel: *See*—
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Graham, Paul R.: *See*—
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Gramza, Eugene P.; and Schreiber, David D., to Eastman Kodak Company. Photographic transfer elements and processes for preparing and using them. 3,671,240, Cl. 96-29.00r.

Granco Equipment, Inc.: *See*—
Phillips, William A., 3,670,668.

Grandmontagne, Walter, to Moeller & Neumann G.m.b.H. Positioning device for aligning plates on a rollway. 3,670,864, Cl. 198-29.000.

Granger, Maurice. Apparatus adapted to form collars around openings previously executed in plates or tubes. 3,670,547, Cl. 72-75.

Granirer, Louis W., deceased (by Granirer, Minna B.); Granirer, Samuel; and Pearlman, Robert I.; executors, to Granirer, Minna B. Reaction products of placenta extracts and penicillin. 3,671,627, Cl. 424-105.000.

Granirer, Minn: *See*—
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Granirer, Minna B.: *See*—
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Grard, Charles: *See*—
Chabardes, Pierre; Gandilhon, Pierre; Grard, Charles; and Thiers, Michel, 3,671,569.

Grassmann, Hans-Christian; and Walther, Emil, to Siemens Aktiengesellschaft. Apparatus for controlling the field intensity in material processed in a capacitive high frequency field. 3,671,704, Cl. 219-10.810.

Grattan, Worthin F. Automatic transmission for automotive vehicles. 3,670,597, Cl. 74-752.00e.

Gray, William C.: *See*—
Ruehle, William H.; Hodge, John D., Jr.; and Gray, William C., 3,671,929.

Grazier, Robert L.; and Kudingo, Kenneth F., to Service Dynamics, Inc. Self-propelled cable burying apparatus. 3,670,512, Cl. 61-72.600.

Great Lakes Carbon Corporation: *See*—
Prescott, Roger, 3,671,285.

Greenberg, Walter H.; and Voelker, Walter D. Ejecting giant articles from injection mold. 3,671,159, Cl. 425-155.000.

Grewe, Josef, to Electra Flock, Inc. Paint applicator or the like and method of making the same. 3,671,373, Cl. 161-64.000.

Grews, Ferdinand: *See*—
Sasse, Klaus; Scheinpflug, Hans; and Grews, Ferdinand, 3,671,639.

Griffin, Charles K.: *See*—
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Grimm, David W., to Amerace Esna Corporation. Fastening device with captive, axial floating nut. 3,670,796, Cl. 151-41.750.

Griner, Arthur J.; and Blain, William A., to Nabisco, Inc. Snack food forming apparatus. 3,671,163, Cl. 425-297.000.

Grinnell, Fred I.; and Hall, Clark J. Retractable guard and guide for nailer. 3,670,941, Cl. 227-8.000.

Griot, Rudolf G.; and Buzzolini, Mario G., to Sandoz-Wander, Inc. Glutaric acid derivatives. 3,671,583, Cl. 260-535.00p.

Griswold, Augustus W., to Dynak, Inc. Fluid flow control device. 3,670,768, Cl. 137-606.000.

Groff, Richard T.: *See*—
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Groh, Gunther, to U.S. Philips Corporation. Optical multiplex filter system. 3,671,106, Cl. 350-162.0sf.

Grover Machine Company: *See*—
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Groves, Sydney L.; Kuchta, Frank J.; Lewis, J. Stephen; Maurer, Donald J.; May, Richard L.; Ryan, John W.; and Vowles, Colin, to Mattel, Inc. Adjustable hair doll. 3,670,451, Cl. 46-135.000.

Grozier, John David: *See*—
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Grubb, Willard T., to General Electric Company. Hydrogen ion-selective sensor. 3,671,414, Cl. 204-195.00r.

GTE Automatic Electric Laboratories, Incorporated: *See*—
Reimer, William A., 3,670,409.
Reimer, William A., 3,671,950.
Storz, Frederick G., 3,671,958.
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GTE Sylvania Incorporated: *See*—
Arrington, William L.; Gantt, Wayne Carlton; and Gouger, Leonard Joseph, 3,671,903.
Ryan, John T.; and Ingalls, Jeffrey D., 3,671,809.
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Guerrato, Alfredo: *See*—
Lo Monaco, Sergio; Guerrato, Alfredo; Fabbro, Dario; and Donadello, Graziello, 3,671,493.

Guerre, Robert P.; and Ruland, Ross R., to Esso Research and Engineering Company. Chamberless high intensity burner employing auxiliary air flow. 3,671,173, Cl. 431-182.000.

Guerster, Rene L., to Ametek, Inc. Tube. 3,670,773, Cl. 138-155.000.

Guggi, Walter Bernhard. Stabilized sine wave inverter. 3,671,845, Cl. 321-20.000.

Guido, Jurgen. Clearance compensating mechanism, especially for valve drives of internal combustion engines. 3,670,707, Cl. 123-90.570.

Guinan, Joseph C., to Norton Company. Foam tape applicator. 3,671,364, Cl. 156-574.000.

Guinard, Paul Andre, to Etablissements Pompes Guinard. Electric pump assembly for use in pumping explosive or dangerous liquids. 3,671,152, Cl. 417-422.000.

Gulf & Western Industries, Inc.: *See*—
Seipp, William H., 3,671,817.

Gulf Research & Development Company: *See*—
Joyce, Thomas P., Jr.; Lagally, Ralph W.; and Schulz, Johann G. D., 3,671,579.
Porter, Warren K., Jr., 3,671,457.

Gulton Industries, Inc.: *See*—
Herman, Bernard B.; and Farley, Vincent P., Jr., 3,671,320.
Herman, Bernard B.; and Farley, Vincent P., 3,671,321.

Gundlach, Richard P., to Industries, Inc., mesne. Film training projector. 3,671,736, Cl. 240-47.000.

Gundlach, William J., to Geo Space Corporation. Flexible seismic gas exploder. 3,670,840, Cl. 181-.5nc.

Gunter, Alec C. Apparatus for preparing a cocoa concentrate. 3,671,273, Cl. 99-236.0cc.

Gunther, Wolfgang H. H., to Xerox Corporation. Selenium containing polymers. 3,671,467, Cl. 260-2.00m.

Guptill, Frank E., Jr.: *See*—
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Gyllstrom, Richard G.: *See*—
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Toldy, Lajos; Borsi, Jozsef; Elek, Sandor; Elekes, Istvan; and Andrasi, Ferenc, 3,671,537.

Gyory, Emeric J.; and Teichmann, Otmar E., to Borg-Warner Corporation. Lip type seal. 3,671,048, Cl. 277-227.000.

Haas, Charles H., to Budd Company, The. Method of making flexible brake bands. 3,670,392, Cl. 29-411.000.

Haas, Guenther; and Reinhardt, Dieter, to Siemens Aktiengesellschaft. Circuit arrangement for generation timing pulses. 3,671,873, Cl. 328-63.000.

Haas, Werner E. L.; and Adams, James E., to Xerox Corporation. Imaging system. 3,671,231, Cl. 96-1.000.

Haas, Werner Erwin Louis; Adams, James Ewing; and Mechlowitz, Blea, to Xerox Corporation. Method for producing images. 3,671,237, Cl. 96-27.000.

Hack, Helmuth: *See*—

Westphal, Kurt; Meiser, Werner; Fue, Ludwig; and Hack, Helmuth, 3,671,523.
Haering, Rudolph R.; and O'Hanlon, John F. High voltage thin-film transistor. 3,671,820, Cl. 317-235.00r.
Hafeli, Hans-Rudolf: *See—*
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Haga, Teruhide; Yamaguchi, Hisashi; and Hirao, Yotaro, to Konishiroku Photo Industry Co., Ltd. Silver halide emulsion fog inhibited with quaternary ammonium, triazole and tetrazaindene compounds. 3,671,255, Cl. 96-109.000.
Hagemeyer, Hugh J., Jr.; and Robinson, Alfred G., III, to Eastman Kodak Company. Hexahydro-3,3,6,6-tetra alkylfuro(3,2-b)furan-2,5-diol. 3,671,550, Cl. 260-347.800.
Hagemeyer, Hugh J., Jr.; and Goss, Harry F., to Eastman Kodak Company. Butene recovery. 3,671,603, Cl. 260-677.00a.
Hagen, Helmut; and Becke, Friedrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 2-carbamyl-tetrahydropyrimidines. 3,671,522, Cl. 260-247.500.
Hagfors, Gerald D.: *See—*
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Haile, Ernest. Vacuum pump operated musical instrument. 3,670,617, Cl. 84-330.000.
Halcon International, Inc.: *See—*
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Onsager, Olav Torgeir, 3,671,568.
Hale, Frank E., Jr.; and Hale, Frank E., Sr. Apparatus for removing oil from a body of water. 3,670,896, Cl. 210-242.000.
Hale, Frank E., Sr.: *See—*
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Hall, Harold H., Sr. Fishing rod holder for boats. 3,671,001, Cl. 248-43.000.
Hall, John B., Jr.; Tung, Yi; and Winn, Lavern E., to United States of America, National Aeronautics and Space Administration. Liquid waste feed system. 3,670,890, Cl. 210-104.000.
Hall, Maurice B., 1/3 to Bowling, Harold F.; and and 1/3 to Gitlin, Edward E. Clock scale demonstrator. 3,670,428, Cl. 35-39.000.
Hall, Robert N., to General Electric Company. Removal of acceptor impurities from high purity germanium. 3,671,330, Cl. 148-1.600.
Halliday, Denis Malcolm: *See—*
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Halpern, Alfred, to Synergistics, Inc. Polyvinylpyrrolidone-iodine compounds. 3,671,545, Cl. 260-326.5fl.
Hamilton, Colin B.; and Oles, Edward J., Jr., to United States Steel Corporation. Method for preventing high-temperature blistering of copper coatings electro-deposited on copper substrates. 3,671,407, Cl. 204-32.00r.
Hamilton, David G., Jr. Angularly adjustable square holder. 3,670,418, Cl. 33-75.00r.
Hamilton, Otis L., 1/2 to Doane, Frank. Skid inverting device. 3,670,903, Cl. 214-1.00q.
Hamm, Philip C., to Monsanto Company. Chemosterilant compositions for flies and method of use. 3,671,635, Cl. 424-319.000.
Hampel, Daniel; and Lerch, Joseph Bryan, to United States of America, Air Force, mesne. Sample and hold circuit. 3,671,783, Cl. 307-238.000.
Hanchett, George D., to RCA Corporation. Switching circuits. 3,671,778, Cl. 307-252.00b.
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Hansen, Gerhard. Apparatus for filling a chamber. 3,670,787, Cl. 141-250.000.
Hansen, Iver C.: *See—*
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Hansen, John Edward, to Du Pont de Nemours, E. I., and Company. Etched and ridged polyamide monofilament. 3,671,381, Cl. 161-180.000.
Hanson, Laurence B.; and Arthur, Wallace W., to Gardner-Denver Company. Control system for drills. 3,670,826, Cl. 173-4.000.
Hanson, Roy R. Powder metering device for loading ammunition. 3,670,928, Cl. 222-288.000.
Hara, Ei; and Suzuki, Shohachi, to Tamagawa Kikai Kinzoku Kabushiki Kaisha. Core rod stopping and releasing device in a powder material forming press. 3,671,164, Cl. 425-414.000.
Harata, Mituo: *See—*
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Rock, Edward M.; Loughman, Joseph F., Jr.; and Mc Manus, Ann, 3,670,872.
Hardtl, Karl Heinz, to U.S. Philips Corporation. Electromechanical resonator employing piezoelectric ceramic consisting of lead zirconate-titanate containing manganese monoxide. 3,671,765, Cl. 310-9.500.
Hardwick, Peter D.; and Trombetta, John J. Aerosol cartridge for pressing irons. 3,670,433, Cl. 38-77.300.
Hardy, Thomas G., Jr. Apparatus for removing skin sections. 3,670,734, Cl. 128-305.000.
Harkness, Joseph R., to Briggs & Stratton Corporation. Electrical system for tractor powered by magneto ignition engine. 3,671,851, Cl. 322-90.000.
Harlow, Norman E., to Image Systems, Inc. Selector for edge notch coded card-type items. 3,670,885, Cl. 209-80.500.
Harmon, Carlyle, to Johnson & Johnson. Absorbent product containing a hydrocolloidal composition. 3,670,731, Cl. 128-284.000.
Harnden, John D., Jr., to General Electric Company. Flexible electronic integrated circuit camera control assembly. 3,670,639, Cl. 95-11.00l.
Harnden, John D., Jr., to General Electric Company. Simultaneous light triggering of thyristor arrays. 3,671,749, Cl. 250-208.000.
Harner Robert H.; and Meister, Otto, to S&C Electric Company. Switch construction with load break device having a movable slat, a gas expansion chamber and a gas muffler. 3,671,697, Cl. 200-144.00r.
Harnisch, Heinz: *See—*
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Harratt, Anthony James, to Hi-Ton Machine Tools Limited. Honing tool arrangements. 3,670,456, Cl. 51-34.00d.
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Stanton, Arthur J.; Kolb, Edwin R.; and Roberts, Webster C., 3,670,632.
Hartlein, Robert C.; Kiles, James D.; Larson, Willard D.; and Olson, Carl R., to Dow Corning Corporation. Combustible cartridges. 3,670,649, Cl. 102-38.000.
Hartmann, Werner: *See—*
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Hause, Gilbert K., to General Motors Corporation. Torque converter transmission. 3,670,596, Cl. 74-710.500.
Hauser, Raimund: *See—*
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Hawaiian Sugar Planters' Association: *See—*

Nickell, Louis G., 3,671,219.
Hawes, Roland J., Jr.; and Daniel, Milton P., said Daniel assor. to said Hawes. Control system for multiple ingredient dispensing apparatus. 3,670,923, Cl. 222-2.000.
Hawkins, Harold R. Oil well tool positioning and coupling starting apparatus. 3,670,603, Cl. 81-53.000.
Hayashi, Kiyohide: *See—*
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Hayes, John R.; Eckart, Francis H.; and Peck, Donald E., to General Motors Corporation. Rammer head. 3,670,624, Cl. 89-47.000.
Hayes, John T.; and Currier, Robert G., to Collins and Aikman Corporation. Fabric containment constructions. 3,670,504, Cl. 61-3.000.
Hayes, Thomas J., Jr., to Anbeck Corporation. Double acting slips. 3,670,374, Cl. 24-263.0ad.
Haynes, Joel E. Liquid level sensor incorporating pulse techniques. 3,670,765, Cl. 137-392.000.
Hazlewood, Lewis F., to Walter & Kidde Company, Inc. Disposable inflatable tourniquet. 3,670,735, Cl. 128-327.000.
Heady, Orville E.; Towell, John F.; and Standifer, Richard L., to United States of America, Atomic Energy Commission. Plutonium hexafluoride reduction. 3,671,199, Cl. 23-284.000.
Healey, Anthony John, to Bell Telephone Laboratories, Incorporated. Multiple output fluidic gate. 3,670,753, Cl. 137-81.500.
Health Systems, Inc.: *See—*
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Heim, Kenneth J.; and Rimmler, Fred F., to Doering, A. L., Mfg. Corporation. Spark plug wrench. 3,670,605, Cl. 81-125.000.
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Heiss, Frederick H.; and Lindblom, Carl E., to Valspar Corporation, The. Method and apparatus for tinting paint. 3,670,785, Cl. 141-9.000.
Heitmann, Knut; and Schneider, Eckart, to Leitz, Ernst, G.m.b.H. Method of synchronizing the change of digits in absolute-value measuring devices and apparatus therefor. 3,671,750, Cl. 250-237.00r.
Held, John F.: *See—*
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Helker, George J. Power driven vehicle for surface travel on a body of water. 3,670,684, Cl. 114-66.05p.
Hell, Rudolf, Kommanditgesellschaft: *See—*
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Hellerbach, Joseph; Szente, Andre; and Walser, Armin, to Hoffmann-La Roche Inc. Benzodiazepin-2-ones and processes for their preparation. 3,671,518, Cl. 260-239.30d.
Hellermann, Paul, G.m.b.H.: *See—*
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Hemsath, Klaus H., to Midland-Ross Corporation. Quench system for pipes. 3,671,027, Cl. 266-6.00s.
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Henle, Robert A., to International Business Machines Corporation. Difference amplifier. 3,671,772, Cl. 307-291.000.
Henley, Virgil E.; and Lauer, Walter W., to General Tire & Rubber Company, The. Inflatable ply turn up bladder for a tire building machine. 3,671,358, Cl. 156-401.000.
Henning, Eberhard, to Hell, Rudolf, Kommanditgesellschaft. Apparatus for producing corrected photographic color rastered reproductions. 3,671,666, Cl. 178-6.70r.
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Henry, James L., to National Cash Register Company, The. Film canister. 3,670,982, Cl. 242-71.200.
Henry, James L.; and Schimpf, Luther G., to Bell Telephone Laboratories, Incorporated. Subscriber loop range extender. 3,671,676, Cl. 179-16.00f.
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Herman, Bernard B.; and Farley, Vincent P., Jr., to Gulton Industries, Inc. Battery plate treatment process. 3,671,320, Cl. 136-75.000.
Herman, Bernard B.; and Farley, Vincent P., to Gulton Industries, Inc. Process for production and treatment of battery plates. 3,671,321, Cl. 136-75.000.
Herman, James A., to Prenco Manufacturing Co. Flow control and damping means. 3,670,666, Cl. 110-7.00r.
Herose, Hans, to Anciens Ets., T.M.B.-J. Tobler S.A. Positioning device. 3,670,582, Cl. 74-88.000.
Herron, Christopher C., to International Business Machines Corporation. Laminated dynamoelectric machine having nonmagnetic lamina for structural support. 3,671,787, Cl. 310-154.000.
Herzog, Ellwood P.: *See—*
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Hess, Marlin F.; and Hess, Grace A. Vehicle screen. 3,670,798, Cl. 160-354.000.
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Hill, D. Brian R., to Westvaco Corporation. Decurling method and apparatus. 3,670,645, Cl. 101-181.000.
Hillman, Juanita J.; and Horowitz, Raymond H., to United States of America, Interior. Reverse-osmosis membranes. 3,671,516, Cl. 260-229.000.
Hinkley, David F., to Merck & Co., Inc. Process for preparing ascorbyl-3-phosphate and salts thereof. 3,671,549, Cl. 260-343.700.
Hinkston, Paul R. Collapsible cycle carrier. 3,670,935, Cl. 224-42.03.
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Hofer, Lawrence John Edward; and Manes, Milton, to Calgon Corporation. Recovery of adsorbate from activated carbon. 3,670,424, Cl. 34-9.000.
Hoffman, Paul. Laminated paper with reinforcing scrim. 3,671,372, Cl. 161-58.000.
Hoffmann, Gotfred O., to Tri-Tech, Inc., mesne. Stepper motor with stator biasing magnets. 3,671,841, Cl. 318-696.000.
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Hofgesang, Edwin M., to Continental Oil Company. Defoaming compositions and methods of producing same. 3,671,460, Cl. 252-358.000.

Hofmann, Gottfried; and Stull, James T., to United States Steel Corporation. Trap door to prevent water from descending into starter bar pit. 3,670,804, Cl. 164-274.000.

Hogan, Elmer R.; and Simpson, John I., to Smith-Berger Manufacturing Corporation. Fish-beheading and cleaning apparatus. 3,670,363, Cl. 17-55.000.

Hogel, John J., to General Electric Company. Fast initial response nuclear reactor control system. 3,671,390, Cl. 176-24.000.

Hogya, Bernard J.: *See—*
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Hokanson, Lyle W., and; and Fowke, Ronald T., to Heath & Sherwood Drilling Limited. Underground drilling machine. 3,670,827, Cl. 173-146.000.

Holland, Eldie H. Space motion simulator system. 3,670,581, Cl. 74-86.000.

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Holland, John H., to Holland, J. H., Company, The. Aggregate handling method and system. 3,670,909, Cl. 214-43.000.

Holle, Werner; and Kessler, Arthur, to Leitz, Ernst, G.m.b.H. Apparatus for controlling the shutter speed of photographic cameras. 3,670,636, Cl. 95-10.0ct.

Hollison, Ronald B.: *See—*
Stettner, Dennis; and Hollison, Ronald B., 3,670,535.

Holmes, Oliver W. Condition monitoring apparatus. 3,671,760, Cl. 307-116.000.

Holt, Chester H. Folding rocking chair with folding seat support. 3,671,072, Cl. 297-32.000.

Holzman, Mark, to Western Geophysical Company of America. Two-sweep signal transmission and reception in seismic exploration. 3,671,932, Cl. 340-15.5cp.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Date, Tasuku; and Hashimoto, Eiichi, 3,670,710.

Honeywell Inc.: *See—*
Bentsen, Louis J., 3,670,745.
Hron, Roland L.; and Jannink, Franciscus A., 3,671,169.
Sollman, George H.; and Dixon, Samuel J., 3,671,960.
Stauffer, Norman L., 3,671,681.

Honeywell Information Systems Inc., mense: *See—*
Lipp, James P.; and Jones, William H., 3,671,935.

Honeywell Information Systems, Inc., mesne: *See—*
Maggio, Anthony F., Jr., 3,671,945.

Honnen, Lewis R.; Andrewsen, Harry W.; Lindstrom, Eddie G., deceased (by Lindstrom, Jean H.; special administratrix). Process for preparing polyolefin-substituted amines. 3,671,511, Cl. 260-93.7.

Hooker Chemical Corporation: *See—*
Murphy, Donald P., 3,671,465.
Rausch, Werner; Oei, Hans Young; and Moller, Siegfried, 3,671,332.

Hooker, Marvin L., Jr.: *See—*
Rutherford, Kenneth R.; Hooker, Marvin L., Jr.; and Alibrandi, Joseph P., 3,671,866.

Hopermann, Richard Konrad, to Borden Company, The. Moisture resistant packaging material. 3,671,294, Cl. 117-76.

Horgan, William J., Jr., to Blumcraft of Pittsburgh. Lock for a glass door. 3,670,537, Cl. 70-120.000.

Hori, Kikuo: *See—*
Fukushima, Takaaki; Takizawa, Haruki; Hori, Kikuo; Sato, Yoshito; and Mizumori, Haruhiko, 3,671,623.

Hori, Takashi, to Osaka Seiki Works, Ltd. Feeding device for machine tools. 3,670,461, Cl. 51-215.0hm.

Horiguchi, Shojiro: *See—*
Terai, Shiro; Suzuki, Toshio; Hasegawa, Yoshihumi; Horiguchi, Shojiro; Nakamura, Michiei; Kimata, Shizuo; and Suzuki, Tadanobu, 3,671,476.

Horowitz, Donald J., to Lockheed Aircraft Corporation. Optical probe. 3,670,426, Cl. 35-12.00n.

Horowitz, Raymond H.: *See—*
Hillman, Juanita J.; and Horowitz, Raymond H., 3,671,516.

Hosey, William F., to Old Hickory Mfg. Co. Garment form retainer. 3,670,931, Cl. 223-71.000.

Hosokawa Funtaikogaku Kenkyusho Osaka: *See—*
Hosokawa, Masuo; Yokoyama, Tohei; and Nakagawa, Fumio, 3,670,886.

Hosokawa, Masuo; Yokoyama, Tohei; and Nakagawa, Fumio, to Hosokawa Funtaikogaku Kenkyusho Osaka. Powder classifier. 3,670,886, Cl. 209-139.00a.

Houdaille Industries, Inc.: *See—*
Cady, Percy L., Jr., 3,670,610.

Houle, Conrad G.; and Masseth, Thomas J., to Eastman Kodak Company. Sensitized pyrylium photobleachable dye in gelatin. 3,671,251, Cl. 96-89.000.

Houlihan, William J.; and Manning, Robert E., to Sandoz-Wander, Inc. 2,3,5,6-Tetrahydroimidazo[2,1-b] thiazoles. 3,671,533, Cl. 260-306.700.

Houlihan, William J.; and Manning, Robert E., to Sandoz-Wander, Inc. 6,6-Di-lower alkyl-2,3,5,6-tetrahydroimidazo [2,1-b] thiazoles. 3,671,534, Cl. 260-306.700.

Houston, Robert D., to Xerox Corporation. Digital signal synchronizing system. 3,671,776, Cl. 307-269.000.

Hovius, Eerenst Frans, to U.S. Philips Corporation. Apparatus for aligning two objects which comprises a source of light, a photosensitive detection system and two pattern carriers. 3,671,755, Cl. 250-237.00r.

Howard, Edward G., Jr., to Du Pont de Nemours, E. I., and Company. Copolymers of fluoroketone imines with polymerizable unsaturated compounds. 3,671,509, Cl. 260-87.500.

Howard, Robert J.: *See—*
Cory, Victor W.; Williams, Edgar E.; and Howard, Robert J., 3,670,702.

Howden, James, & Company Limited: *See—*
Fraser, William Milton; Cairns, Walter John; and Mac Donald, Ian Norman, 3,671,149.

Howe, Spencer D., to Hughes Aircraft Company. Oscillating mechanism. 3,671,766, Cl. 310-39.000.

Howell, Elgan Neville: *See—*
Hunn, Bernard Albert; and Howell, Elgan Neville, 3,671,721.

Hoxsie, Frank E. Portable self-starting fluorescent lamp. 3,671,803, Cl. 315-99.000.

Hoyler, Gerhard: *See—*
Behn, Reinhard; Gottlob, Heinrich; Haid, Hans; Hoyler, Gerhard; and Kessler, Hartmut, 3,670,378.

Hoyt, Charles T.; Haun, John W.; Hensel, Dwight L.; Hansen, Clarence M.; Lovely, Walter G.; and Bruhn, Hjalmar D., to Brillion Iron Works, Inc. Forage blower. 3,671,077, Cl. 302-8.000.

Hron, Roland L.; and Jannink, Franciscus A., to Honeywell Inc. Delayed fuel and post ignition timed burner control system. 3,671,169, Cl. 431-67.000.

Hsiao, Mu-Yue: *See—*
Bossen, Douglas C.; and Hsiao, Mu-Yue, 3,671,947.

Hubbard, Alan M. Method and means providing dosages of oral hygienic substance. 3,670,927, Cl. 222-107.000.

Huber, William W.; and Dana, Richard L., to United States Ceramic Tile Company. Method for dry pressing ceramic tile. 3,671,618, Cl. 264-120.000.

Huck, Rainer F.: *See—*
Davis, Louis E.; Jensen, Billy M.; Larson, Floyd L.; Huck, Rainer F.; and Stumph, Stephen L., 3,670,386.

Hudis, Ann: *See—*
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Hudson, H. D., Manufacturing Company: *See—*
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Hudswell Yates Developments Limited: *See—*
Ede, Ainsley Neville, 3,670,431.

Huff, Ronald G., to United States of America, National Aeronautics and Space Administration. Apparatus for sensing temperature. 3,671,329, Cl. 136-233.000.

Huffaker, Walter D., to Ma-Tran Corporation. Method and apparatus for handling material. 3,671,079, Cl. 32-29.000.

Hughes Aircraft Company: *See—*
Calhoun, Donald F., 3,670,956.
Day, Richard A.; and French, William E., 3,671,728.
Gates, Louis E., Jr.; and Lent, William E., 3,671,275.
Gentile, Anthony L.; and Stafsudd, Oscar M., 3,671,203.
Howe, Spencer D., 3,671,766.
Kaspaul, Alfred F.; and Kaspual, Erika E., 3,671,238.
Mitchell, John E., 3,671,918.

Hughes, Gordon A.: *See—*
Tokolics, Joseph; Hughes, Gordon A.; and Smith, Herchel, 3,671,519.

Hull, Charles W., to Bell & Howell Company. Method for focusing a double focusing mass spectrometer. 3,671,737, Cl. 250-41.9me.

Humphreys, Robert Eric: *See—*
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Humphries, Darral V., to Bethlehem Steel Corporation. Method of forming seal for multi-wire strand. 3,671,622, Cl. 264-263.000.

Hundere, Alf. Apparatus for determining the thermal stability of fluids. 3,670,561, Cl. 73-61.200.

Hunn, Bernard Albert; and Howell, Elgan Neville, to Revenue Systems Limited. Data reading systems. 3,671,721, Cl. 235-61.11h.

Hunt, George H., to Simplex Wire and Cable Company. Cross-linked polyolefin composition. 3,671,513, Cl. 260-93.700.

Hunter, William D., Jr.: *See—*
Esterhoy, Charles J., Jr.; Hunter, William D., Jr., 3,671,202.

Huntzinger, Gerald O.; and Sheldrake, Leonard J., to General Motors Corporation. Dual voltage charging system. 3,671,843, Cl. 320-15.000.

Hurlebaus, Richard P., to Budd Company, The. Arc spot weld control and power supply. 3,671,713, Cl. 219-127.000.

Hutchins, Francis E.: *See—*
Carlson, Bernard C.; and Hutchins, Francis E., 3,671,634.

Huttemann, Thomas J., Jr.: *See—*
Oftedahl, Edwin N.; Huttemann, Thomas J., Jr.; and Goffe, Charles A., 3,671,260.

Hwang, Paul Y., to Ampex Corporation. Cobalt doped gamma ferric oxide. 3,671,435, Cl. 252-62.560.

Hydril Company: *See—*

Lerouax, Robert K., 3,670,761.
Hyster Company: *See—*
Olson, John E.; Bostad, Wayne W.; and Price, Norman L., 3,670,626.
Iantorno, James F.; Wagner, John; and Schumacher, Stephen J., to Sealectro Corporation. Insulated electric terminal assembly. 3,671,920, Cl. 339-59.00r.
Iarossi, Frank J., to Esso Research and Engineering Company. Thermal transition design for vessels carrying liquid cargoes at nonambient temperatures. 3,671,315, Cl. 114-74.00a.
Ichimura, Hirohisa: *See—*
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IIT Research Institute: *See—*
Ali, Mir Akbar; and Pincus, Alexis G., 3,671,380.
Ikeda, Hirosaka: *See—*
Kawakita, Takao; Ikeda, Hirosaka; Matsumura, Shigeru; and Taniguchi, Kunichiko, 3,671,300.
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Image Systems, Inc.: *See—*
Harlow, Norman E., 3,670,885.
Imai, Atsuo; Harata, Mituo; Ogawa, Yoshitaka; and Hasegawa, Shoji, to Tokyo Shibaura Electric Co., Ltd. Solid electrolyte. 3,671,324, Cl. 136-153.000.
Imai, Nobuhiro: *See—*
Goshima, Takeshi; and Imai, Nobuhiro, 3,670,992.
Imperial Chemical Industries Limited: *See—*
Andrews, Timothy Douglas; Short, Glyn David; and Thomas, Ieuan, 3,671,250.
Dixon, David Rodney; Rose, John Brewster; and Turton, Cecil Nigel, 3,671,486.
King, John Howliston; and Smith, Frank, 3,671,415.
Knight, Michael Horace, 3,671,498.
White, Brian Graham, 3,671,213.
Inacker, Frederick T.: *See—*
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Ingalls, Jeffrey D.: *See—*
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Ingham, Robert M., Jr., to Deering Milliken Research Corporation. Drafting apparatus. 3,670,367, Cl. 19-255.
Inland Systems, Inc.: *See—*
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Innocenti Societa Generale per l'Industria Metallurgica: *See—*
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Inoue, Tadahiko: *See—*
Nishimura, Tatsumi; Inoue, Tadahiko; Tsuboi, Takeo; and Kado, Masaru, 3,671,640.
Inoue, Taiichi; and Ueda, Toshimasa, to Tokyo Shibaura Electric Co., Ltd. Germanium and silicon substituted manganese activated magnesium gallate phosphor. 3,671,452, Cl. 252-301.40f.
Inoue, Taiichi; and Ueda, Toshimasa, to Tokyo Shibaura Electric Co., Ltd. Silicon and/or germanium dioxide substituted manganese activated magnesium aluminate gallate phosphor. 3,671,454, Cl. 252-301.40f.
Inoue, Takehisa; Sato, Masaki; and Hashiguchi, Takeshi, to Toray Industries, Inc. Transalkylation of aromatic hydrocarbons. 3,671,602, Cl. 260-672.00t.
Inoue, Takeshi, to Kurashiki Rayon Co., Ltd. Process for the manufacture of composite filaments and yarns. 3,671,620, Cl. 264-171.000.
Inspection Engineering and Equipment, Inc.: *See—*
Kiewicz, Frank M.; and Zink, Paul R., 3,670,420.
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Mc Cabe, John P., 3,671,685.
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Inter-Probe, Inc.: *See—*
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International Business Machines Corporation: *See—*
Bakke, Roger M., 3,671,725.
Bossen, Douglas C.; and Hsiao, Mu-Yue, 3,671,947.
Dushkes, Sherman Z.; and Surty, Rohinton J., 3,670,944.
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Johnson, Robert L.; and Leach, David W., 3,670,612.
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International Computers Limited: *See—*
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International Harvester Company: *See—*
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Lienemann, Darlo; and Henry, Daniel, 3,670,671.
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Tufts, Guy O.; Scarnato, Thomas J.; and Peacock, Peter J., 3,670,483.
International Paper Company: *See—*
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Galanes, Hector J., 3,670,949.
International Plasma Corporation: *See—*
Bersin, Richard L., 3,671,195.
International Standard Electric Corporation: *See—*
Beilmann, Alfred, 3,671,701.
Knauer, Hans Ulrich, 3,671,679.
International Telephone and Telegraph Corporation: *See—*
Scarlett, Robert M., 3,671,793.
Waltermire, Clayton L., 3,671,792.
Irani, Riyad R.; and Roberts, H. Evan, to Monsanto Chemical Company. Antiseptic compositions containing phenolic bactericides potentiated with phosphonic acid derivatives. 3,671,644, Cl. 424-346.000.
Ireland, Henry R.; and Snyder, Paul W., Jr., to Mobil Oil Corporation. Upgrading of crude oil by combination processing. 3,671,419, Cl. 208-57.000.
Irie, Toshiaki; Sato, Katsuo; and Nanko, Yoshiyuki, to Nippon Electric Company, Limited. Transistor device with plateau emitter and method for making the same. 3,671,340, Cl. 148-187.000.
Irie, Yoshihiko; and Kimura, Fumio, to Tokoco Ltd. Overhead traveling type fuel supplying apparatus. 3,670,930, Cl. 222-527.000.
Ironflex AG: *See—*
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Ishikawa, Hajime: *See—*
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Ishizaki, Sumio: *See—*
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Ishizuka, Hiroshi. Method for preparing zirconium tetrachloride and hafnium tetrachloride. 3,671,186, Cl. 23-24.00z.
Islip, Peter John, to Parke, Davis & Company. 5-Nitro-4-thiazoline-2-ylidene-3-acetamide compounds and derivatives thereof. 3,671,650, Cl. 260-294.8.
Itami, Kazuo: *See—*
Yasui, Koichi; Yamamoto, Kazuo; Itami, Kazuo; Fujisawa, Kiyoshi; and Saskai, Toshio, 3,671,279.
Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yositosi; and Fujimoto, Keimei, to Sumitomo Chemical Company, Ltd. 5-Prorargylthenyl cyclorropane-carboxylates. 3,671,548, Cl. 260-332.20r.
Itek Corporation: *See—*
Bowker, John Kent, 3,671,130.
Ito, Riyokichi, to Katsukawa Kogyo Kabushiki Kaisha. Low-deck truck for carrying an article to be treated. 3,670,900, Cl. 212-14.000.
Itoh, Kunio: *See—*
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Iversen, Svend Erik: *See—*
Knudsen, Erik Stenberg; Iversen, Svend Erik; Lund, Svend Aage; and Northeved, Allan, 3,671,858.
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Iwasaki, Hiroshi: *See—*
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Iwasaki Tsushinki Kaisha: *See—*
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Iwatsu Electric Company Ltd.: *See—*
Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, 3,671,936.
Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, 3,671,937.
Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, 3,671,941.
Izuta, Tadao, to Nippon Gakki Seizo Kabushiki Kaisha. Stabilizer for archery bow. 3,670,712, Cl. 124-30.00r.
Jack, Ronald H., to Teletype Corporation. Self-testing insertion tool and methods of inserting workpieces. 3,670,388, Cl. 29-244.000.
Jackson, Billy G., to Lilly, Eli, and Company. Cephalosporin compositions. 3,671,449, Cl. 252-182.000.
Jackson, David L. Underwater dye-marker release mechanism. 3,670,692, Cl. 116-124.00b.
Jackson, George W.; and Whelan, James E., to General Motors Corporation. Engine cam operated air compressor for vehicle leveling system. 3,671,150, Cl. 417-395.000.
Jackson, Winston J., Jr.; and Watson, Marshall T., to Eastman Kodak Company. Textile yarn. 3,670,489, Cl. 57-140.000.
Jacobs, Herbert V.: *See—*

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Jaffe, Joseph; and Kittrell, James R., to Chevron Research Company. Hydrotreating process using a catalyst comprising a fluorine-containing layered crystalline aluminosilicate. 3,671,425, Cl. 208-216.000.
Jahnle, Herbert A., to Budd Company, The. Low temperature Zn-Al-Cu casting alloy. 3,671,227, Cl. 75-178.0ac.
Jakobsen, Kjell Moswoll; and Eriksson, Hanslivar, to Aktiebolaget Platmanufaktur. Producing tubular members of lignocellulose material by compression within an annular chamber. 3,671,386, Cl. 162-224.000.
Jamison, Saunders E., to Celanese Corporation. Diacid-diol based foams and process of making same. 3,671,471, Cl. 260-2.50r.
Janelid, Ingvar. Method of preventing leakage during storage of a gas or a liquid in a rock chamber by artifically supplying a gas or a liquid to the rock surrounding the rock chamber. 3,670,503, Cl. 61-.5.
Jania, Zbigniew J.; and Vanderberg, Lawrence J., to Ford Motor Company. Electronic control system for antiskid vehicle brakes. 3,671,081, Cl. 303-21.0be.
Jannink, Franciscus A.: *See*—
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Janowak, John F.: *See*—
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Jaskolski, Stanley V.; and Seitz, Martin A. Zinc oxide crystal bulk-effect oscillator and method of preparing the same. 3,671,193, Cl. 23-148.000.
Jaworski, Ernest G., to Monsanto Company. Growth-promoting compositions and methods. 3,671,212, Cl. 71-77.000.
Jeffries, Lester A., to Northrop Corporation. High contrast display for electron beam scanner. 3,671,795, Cl. 313-109.000.
Jehn, David H., to Dun-Hot, Incorporated. Popcorn package. 3,671,270, Cl. 99-171.00a.
Jellison, Paul J., to Textron, Inc. Composite washer. 3,670,618, Cl. 85-1.0jp.
Jenny, Robert W., to Boeing Company, The. Landing gear gravel and water deflector. 3,670,996, Cl. 244-103.
Jensen, Billy M.: *See*—
Davis, Louis E.; Jensen, Billy M.; Larson, Floyd L.; Huck, Rainer F.; and Stumph, Stephen L., 3,670,386.
Jinnette, Allen J., to Burlington Industries, Inc. Bleaching procedure for fiberglass fabrics. 3,671,179, Cl. 8-101.000.
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Johnson, Donald L. Method of jet breaking veneer to narrow wood flakes. 3,670,791, Cl. 144-326.00a.
Johnson, Edward B. Silver recovery from photographic wastes. 3,671,222, Cl. 75-83.000.
Johnson, Herbert E., to Union Carbide Corporation. Lactam polymerization with N,N'-dialkyl-azetidinedione initiators. 3,671,500, Cl. 260-78.001.
Johnson, Herbert E., to Union Carbide Corporation. Lactam polymerization with substituted biuret initiators. 3,671,501, Cl. 260-78.001.
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Johnson, Paul K.: *See*—
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Johnson, Randall W. Enclosure for heat exchange device. 3,671,095, Cl. 312-352.000.
Johnson, Robert B., to Eastman Kodak Company. Film feeding mechanism for motion picture projectors. 3,671,113, Cl. 352-173.000.
Johnson, Robert L.; and Leach, David W., to International Business Machines Corporation. Card cutting apparatus. 3,670,612, Cl. 83-99.000.
Johnson, Robert W.; and Karpiel, Harvey B., to International Harvester Company. Combination fuel tank and operator's seat for tractors. 3,671,070, Cl. 296-65.00r.
Johnson, Walter C.: *See*—
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Johnston, Edward W. Sun cot. 3,670,750, Cl. 135-5.100.
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Jones, Allen J., to Michel Lumber Company. Hanging walls for furnace. 3,670,469, Cl. 52-285.000.
Jones, Charles E. Tape reel container. 3,670,875, Cl. 206-52.00f.
Jones, Cherry E. Person money container. 3,670,933, Cl. 224-28.00b.
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Jones, Johnny W., to Borg-Warner Corporation. Motor and seal section utilizing a fluorinated ether as a single, homogenous, blocking cooling and lubricating fluid. 3,671,786, Cl. 310-87.000.
Jones, Lorin M. Escape mechanism. 3,670,846, Cl. 182-20.000.
Jones, Loyd W.: *See*—
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Jones, Paul W.: *See*—
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Jones, William H.: *See*—
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Jonsson, Kurt Alfred, to Rederiaktiebolaget Nordstjernan. Process for the production of powdered metals. 3,671,220, Cl. 75-.50b.
Joosten, Hendrik, to Bata Shoe Company, Inc. Apparatus for immersing lasted boots in a liquid bath. 3,670,698, Cl. 118-425.000.
Joseph, Douglas C.: *See*—
Eldridge, Merle K.; Bloom, Roy C.; and Joseph, Douglas C., 3,671,248.
Joyce, Thomas P., Jr.; Lagally, Ralph W.; and Schulz, Johann G. D., to Gulf Research & Development Company. Process for oxidizing a 1,1-bis(alkylphenyl) alkane. 3,671,579, Cl. 260-517.000.
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Kehrer, Fritz: *See—*
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Keller, Wolfgang, to Siemens Aktiengesellschaft. Device for crucible-free, floating zone melting a crystalline rod. 3,671,703, Cl. 219-10.750.
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Kelly, John C.; and Moore, Christopher J., to Rolls-Royce Limited. Sandwich structure. 3,670,843, Cl. 181-33.00g.
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Kemsey-Bourne, Kenneth, to English Calico Limited. Production of tubular articles. 3,671,348, Cl. 156-187.000.
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Kent, Miles L. Roll out step for pick up trucks. 3,671,058, Cl. 280-166.000.
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Kessler, Hans-Joachim: *See—*
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Kienzler, Wolfgang; and Burgdorf, Marten, to Kabel- und Gutekoffnungshutte Aktiengesellschaft. Forming hollow blanks. 3,670,554, Cl. 72-347.000.
Kiewicz, Frank M.; and Zink, Paul R., to Inspection Engineering and Equipment, Inc. Gaging head construction. 3,670,420, Cl. 33-174.00l.
Kiewicz, Frank M.; and Zink, Paul R., to Inspection Engineering and Equipment, Inc. Gaging device. 3,670,421, Cl. 33-174.00l.
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Kilgus, Alfred. Temperature compensating device and lens system including same. 3,671,108, Cl. 350-253.000.
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Kimata, Shizuo: *See—*
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Kindl, Erwin; and Riegler, Ernst, to Kalle Aktiengesellschaft. Apparatus for coating a tube of fiber material with viscose by extrusion. 3,670,697, Cl. 118-408.000.
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King, John Howliston; and Smith, Frank, to Imperial Chemical Industries Limited. Continuous lead-in core for an electrode assembly. 3,671,415, Cl. 204-284.000.
King, Lowell A.; and Seegmiller, David W. Electrochemical cell with aluminum electrodes and different electrolyte concentrations in two compartments. 3,671,322, Cl. 136-83.00r.

Kingston, Floyd E. Three phase power controller. 3,671,849, Cl. 323-24.000.

Kiniry, John Michael: *See—*
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Kirwan, James: *See—*
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Kishida, Soichiro: *See—*
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Kitá, Hidehiko, to Nippon Gakki Seizo Kabushiki Kaisha. Bamboo organ pipe assembly. 3,671,660, Cl. 84-349.000.

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Kito, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Safety devices for entrance and exit for moving handrail. 3,670,862, Cl. 198-16.000.

Kittrell, James R.: *See—*
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Klaassen, Anne: *See—*
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Klanatsky, John J., to Emerson Electric Co. Transistor protection circuit. 3,671,879, Cl. 330-207.00p.

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Klein & Anderson Ltd.: *See—*
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Klein, John Ray, to Klein & Anderson Ltd. Tractor trailer lighting systems. 3,671,757, Cl. 307-10.0ls.

Klein, Keith W.; and Dimond, Herbert M., to General Electric Company. Manually operable molded case circuit breaker with special trip testing means. 3,671,890, Cl. 335-22.000.

Klemchuk, Peter P.: *See—*
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Klotinsh, Erik Ernestovich: *See—*
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Knapsack Aktiengesellschaft: *See—*
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Knauer, Hans Ulrich, to International Standard Electric Corporation. Arrangement for the recognition of loop closure in subscriber stations having semiconductor amplifiers fed via the connecting trunk. 3,671,679, Cl. 179-81.00b.

Kneafsey, Adrian W., to Scragg, Ernest, & Sons Limited. Processing of flax derived yarns. 3,670,490, Cl. 57-156.000.

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Knight, Michael Horace, to Imperial Chemical Industries Limited. Copolyamides from bisaminophenylsulfone. 3,671,498, Cl. 260-78.00r.

Knob, Richard W.: *See—*
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Knollman, Dieter John Henry; and Simon, James Louis, to Bell Telephone Laboratories, Incorporated. Calculator for a multiprocessor system. 3,671,942, Cl. 340-172.500.

Knomi, Katsutoshi: *See—*
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Knowles, Richard N., to Du Pont de Nemours, E. I., and Company. Repellant composition comprising certain cyclohexyl ureas and thioureas. 3,671,637, Cl. 424-322.000.

Knowles, Richard N., to Du Pont de Nemours, E. I., and Company. Animal repellant methods using substituted cyclohexyl ureas. 3,671,638, Cl. 424-322.000.

Knowles, Richard N., to Du Pont de Nemours, E. I., and Company. N-Acylcyclohexyl amine repellants and methods of use. 3,671,642, Cl. 424-320.000.

Knudsen, Erik Stenberg; Iversen, Svend Erik; Lund, Svend Aage; and Northeved, Allan, to Slagteriernes Forskningsinstitut. Method and apparatus for measuring the thickness of layers of fat and flesh in carcasses utilizing the difference in electrical. 3,671,858, Cl. 324-65.

Knudsen, John P.: *See—*
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Knudson, Louis I.; Frink, Richard C.; and White, Charles H., to General Laboratory Associates, Inc. Regulatable alternator. 3,671,788, Cl. 310-156.000.

Kobayashi, Tetsuji; and Tabayanagi, Seiichi, to Tokyo Shibaura Electric Co., Ltd. Catheter type semiconductor radiation detector. 3,670,719, Cl. 128-2.00a.

Kobayashi, Tunekazu, to Denki Onkyo Co., Ltd. Contactless rotary switching apparatus. 3,671,874, Cl. 323-94.00h.

Koch, Bent. Method of dyeing or impregnating textiles and an apparatus for carrying the method into effect. 3,671,180, Cl. 8-149.000.

Kodama, Takashi: *See—*
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Koenig, Karl-Heinz: *See—*
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Koenig, Karl-Heinz; Steinbrunn, Gustav; Windel, Hermann; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Biscarbamates. 3,671,571, Cl. 260-471.00c.

Koga, Koichi; Hatori, Minoru; and Akamatsu, Takashi, to Sumitomo Chemical Company, Ltd. Imidomethyl derivatives of 1,3,3-trimethylindolino-spiropyran. 3,671,543, Cl. 260-326.00d.

Kohn, Joseph: *See—*
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Koiwa, Yoichi: *See—*
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Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
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Kolatorowicz, Edwin E.; and Volkmann, Werner K., to General Electric Company. Power conversion control system. 3,671,836, Cl. 318-345.000.

Kolb, Edwin R.: *See—*
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Kolbe, William H.; Sagady, Alexander J.; and Suzuki, Taro, to General Motors Corporation. Epitrochoidal compressor. 3,671,154, Cl. 418-61.000.

Koltz, Lawrence D.: *See—*
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Komata, Toranosuke; Ishihara, Katsumi; and Hashimoto, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Superconductive alloys. 3,671,226, Cl. 75-175.500.

Komatsu, Noboru; Arai, Tohur; and Mizutani, Masayoshi, to Kabushiki Kaisha. Method of chromizing in a fused salt bath. 3,671,297, Cl. 117-113.000.

Komeda, Hiromu: *See—*
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Kometani, Yutaka; Tatemoto, Masayoshi; and Nakamura, Masanori, to Daikin Kogyo Co., Ltd. Method for polymerization of fluorine-containing haloolefins. 3,671,510, Cl. 260-87.50a.

Komisako, Tetuji: *See—*
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Konishiroku Photo Industry Co., Ltd.: *See—*
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Konrat, Jean-Paul: *See—*
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Korchynsky, Michael; Grozier, John David; and Mihelich, John L., to Jones & Laughlin Steel Corporation. High-strength plain carbon steels having improved formability. 3,671,336, Cl. 148-36.000.

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Lutchenkov, Anatoly Matveevich; Shekhodanov, Mikhail Petrovich; Siyanov, Sergei Alexandrovich; Korovin, Ivan Stepanovich; Kholstova, Nonna Alexandrovna; Kreptseva, Valentina Nikolaevna; and Leskovskaya, Nina Petrovna, 3,671,125.

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Kowalski, Xavier, to Monsanto Company. Methods of scale inhibition using substoichiometric amounts of amino alcohol and phosphonic acids. 3,671,448, Cl. 252-18.00d.

Koyanagi, Shunichi; Kitamura, Hajime; and Tajima, Shigenobu, to Shimetsu Chemical Company. Method for preparing polyvinyl chloride. 3,671,508, Cl. 260-87.100.

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Kozacka, Frederick J., to Chase-Shawmut Company, The. Compact polyphase fuse. 3,671,910, Cl. 337-146.000.

Kozacka, Frederick J., to Chase-Shawmut Company, The. System of fluid cooled fuses. 3,671,911, Cl. 337-166.000.

Kraftwerk Union Aktiengesellschaft: *See—*
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Krakauer, C. Leonard, to Kay Manufacturing Corporation. Furniture spring clip and assembly. 3,671,031, Cl. 267-110.

Kralowetz, Bruno. Tool for use in a swaging machine. 3,670,556, Cl. 72-402.000.

Kramer, Wilhelm, to Aktiengesellschaft Brown, Boveri & Cie. Switch contact chamber for electrical circuit breakers of the gas blast type. 3,671,698, Cl. 200-148.

Kranz, Raymond E.: *See—*
Zenner, Walter J.; and Kranz, Raymond E., 3,670,861.

Kraselsky, Maurice A. Budget carrier. 3,670,934, Cl. 224-42.10e.

Krasny, Carl, & Associates, Inc.: *See—*
Kaplan, Irving Leonard, 3,670,902.

Kratky, Raymond H.: *See—*
Pohl, Harold J.; and Kratky, Raymond H., 3,670,747.

Kreider, Franklin M.: *See—*
Levin, Howard J.; and Kreider, Franklin M., 3,670,786.

Krellner, Walter G.; and Shobert, Erle I., II, to Stackpole Carbon Company. Self-aligning bearing. 3,671,092, Cl. 308-72.000.

Krenzer, John, to Velsicol Chemical Corporation. Potassium 4-methyl-1,2,4-oxadiazolidine-3,5-dione and sodium 4-methyl-1,2,4-oxadiazolidine-3,5-dione. 3,671,538, Cl. 260-307.00b.

Kreptseva, Valentina Nikolaevna: *See—*
Lutchenkov, Anatoly Matveevich; Shekhodanov, Mikhail Petrovich; Siyanov, Sergei Alexandrovich; Korovin, Ivan Stepanovich; Kholstova, Nonna Alexandrovna; Kreptseva, Valentina Nikolaevna; and Leskovskaya, Nina Petrovna, 3,671,125.

Krick, David M.; Koltz, Lawrence D.; and Williams, Warren C., to Wisconsin Centrifugal, Inc. Vacuum casting apparatus. 3,670,802, Cl. 164-258.

Kriedt, Frederick A. Water expulsion system. 3,670,680, Cl. 114-16.00r.

Krimmel, Carl Peter, to Searle, G. D., & Co. Dialkylaminoalkyl esters of adamantanethiocarboxylic acids. 3,671,527, Cl. 260-268.

Krob, Erwin: *See—*
Pammer, Gottfried; and Krob, Erwin, 3,670,990.

Kroder, Ernst A., to Dentsply Research & Development Corporation, mesne. Connecting metal elements and products thereof. 3,670,416, Cl. 32-48.000.

Kroemer, Karl Heinrich Eberhard, to United States of America, Air Force. Apparatus for measuring thumb and finger force. 3,670,573, Cl. 73-379.000.

Kroll, Wolfram R., to Esso Research and Engineering Company. Isomerization process employing a novel heterogeneous catalyst. 3,671,597, Cl. 260-666.0py.

Kronenberg, Hans; and Gmur, Dionys, to Swiss Aluminum Ltd. Rail connection. 3,670,899, Cl. 211-182.000.

Kronies, Reinhard K.; and Hansen, Iver C., to Burroughs Corporation. Test apparatus for digital computer. 3,671,940, Cl. 340-172.500.

Kropp, Rudolf: *See—*
Reicheneder, Franz; and Kropp, Rudolf, 3,671,525.

Krumreich, Jack E.: *See—*
Cox, Frederick L.; and Krumreich, Jack E., 3,671,711.

Krup, Donald E., to Karma Division of Brandt Automatic Cashier Company. Apparatus for producing a beverage by mixing a powdered base including sugar and a cold liquid. 3,671,020, Cl. 259-10.000.

Krupa, Thomas J., to Delaware Valley Armaments, Inc. Timing mechanism. 3,670,655, Cl. 102-79.000.

Kruper, Andrew P., to Westinghouse Electric Corporation. Single phase motor starting control apparatus. 3,671,830, Cl. 318-221.00e.

Kubo, Moritada, to Tokyo Shibaura Electric Co., Ltd. System of measuring the distribution of reduction rate of metal stripes. 3,670,568, Cl. 73-159.000.

Kuchta, Frank J.: *See—*
Groves, Sydney L.; Kuchta, Frank J.; Lewis, J. Stephen; Maurer, Donald J.; May, Richard L.; Ryan, John W.; and Vowles, Colin, 3,670,451.

Kuck, Lloyd L., to General Motors Corporation. Tailgate window washer mechanism. 3,671,144, Cl. 417-231.000.

Kudingo, Kenneth F.: *See—*
Grazier, Robert L.; and Kudingo, Kenneth F., 3,670,512.

Kuehnle, Manfred R., to Audac Corporation. System for processing large xerographic prints. 3,671,120, Cl. 355-8.000.

Kuhn, Vladimir: *See—*
Brazda, Ladislav, deceased; Brazdova, Dagmar; heirs; Prochazka, Miloslav; Kuhn, Vladimir; Ozdian, Josef; and Benes, Rudolf, 3,670,484.

Kuiper, Wilhelmus Gerardus; and Klaassen, Anne, to U.S. Philips Corporation. Device for generating a plurality of sinusoidal oscillations in a carrier telephony system. 3,671,880, Cl. 331-51.000.

Kumai, Ko; Motoyoshi, Minoru; Tanaka, Kiyoshi; and Hagiwara, Yasuhira, to Nippon Steel Corporation. Process for producing grain oriented electromagnetic steel sheets having excellent magnetic characteristics. 3,671,337, Cl. 148-111.000.

Kumaiai Chemical Industry Co., Ltd.; and: *See—*
Kado, Masaru; Kimura, Ichiro; and Sugiyama, Hironari, 3,671,216.

Kumashiro, Izumi: *See—*
Yamada, Yoshitaka; Sakurai, Moritaro; and Kumashiro, Izumi, 3,671,649.

Kumial Chemical Industry Co., Ltd.: *See—*
Nishimura, Tatsumi; Inoue, Tadahiko; Tsuboi, Takeo; and Kado, Masaru, 3,671,640.

Kumins, Charles A., to Addressograph-Multigraph Corporation. Electrophotographic member useful as a lithographic master. 3,671,232, Cl. 96-1.800.

Kunzel, Hans-Egon; Wolf, Gerhard Dieter; Blankenstein, Gunter; and Nischk, Gunther, to Farbenfabriken Bayer Aktiengesellschaft. Aromatic polyamides containing the quinazolone ring. 3,671,614, Cl. 260-47.0cz.

Kupfrian, Wilbur J., to Wright, Barry, Corporation, mesne. Self locking fastener. 3,670,795, Cl. 151-29.

Kurashiki Rayon Co., Ltd.: *See—*
Inoue, Takeshi, 3,671,620.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Amagi, Yasuo; Ohya, Masaki; Shiiki, Zenya; and Yusa, Haruhiko, 3,671,610.

Kurita, Takaji; Motoki, Masaya; Emoto, Kazuhiro; and Hojo, Katsuo, to Mitsubishi Paper Mills, Ltd. Liquid developers for electrostatic photography. 3,671,646, Cl. 252-62.100.

Kurosawa, Masatoshi: *See—*
Ozutsumi, Minoru; Kawakami, Kazuo; Ishizaki, Sumio; and Kurosawa, Masatoshi, 3,671,182.

Kuyper, William, to United States of America, Navy. Ammunition container for aircraft. 3,670,623, Cl. 89-34.000.

Kvalheim, Andrew M.; and Wassem, Howard M., to Aim Products, Inc. Universal molding strip for trimming. 3,671,369, Cl. 161-40.000.

Kwantes, Arien; and Stouthamer, Bernhard, to Shell Oil Company. Process for carbonylating alkanols. 3,671,559, Cl. 260-413.000.

Kwolek, Stephanie Louise, to Du Pont de Nemours, E. I., and Company. Optically anisotropic aromatic polyamide dopes. 3,671,542, Cl. 260-308.00r.

Kyburz, Hans. Insulating fitting and method for manufacturing. 3,671,060, Cl. 285-54.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Fujimoto, Yasuo; Nagaoka, Koichi; Tatsukawa, Keizo; and Koiwa, Yoichi, 3,671,482.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
Nakayama, Kiyoshi; and Hagino, Hiroshi, 3,671,396.

La Salle Machine Tool, Inc.: *See—*
Skrentner, Frank C., 3,670,607.

La Sota, Leo S., to McGraw-Edison Company. Liquid mositure detector. 3,671,912, Cl. 338-34.000.

La Violette, Paul A.: *See—*
Kennedy, Ralph C.; La Violette, Paul A.; and Stromberg, Henry M., 3,670,442.

LaBar, Dale H.: *See—*
Watson, Edward J.; and LaBar, Dale H., 3,671,589.

Lacal Industries Limited: *See—*
Crosby, Nobel W.; Walker, Robert C.; and Clarke, Gordon J., 3,670,372.

Lacaze, Rene: *See—*
Aucouturier, Jeanne; and Lacaze, Rene, 3,671,895.

Lagally, Ralph W.: *See—*
Joyce, Thomas P., Jr.; Lagally, Ralph W.; and Schulz, Johann G. D., 3,671,579.

Laird, William Burton; Williams, Roy L.; and Muska, Allen V., to Air Reduction Company, Incorporated. Method and apparatus for the microdispersion of oxygen in water. 3,671,022, Cl. 261-29.

Lake Center Industries: *See—*
Quain, Wilbur C., 3,670,757.

Lakhani, Kishor M.: *See—*
Funk, John W.; and Lakhani, Kishor M., 3,670,647.

Lamb, William Doyle: *See—*
Butcher, James; Gyllstrom, Richard G.; and Lamb, William Doyle, 3,670,760.

Lammert, Charles W.: *See—*
Charleville, Joseph L.; De Tienne, Mart E.; and Lammert, Charles W., 3,670,998.

Land, Edwin H., to Polaroid Corporation. Diffusion transfer image receiving sheet with hydrolyzed polymer layer. 3,671,241, Cl. 96-29.000.

Lanier Electronic Laboratory, Inc., mesne: *See—*
Nye, William M.; and Jones, Stanley W., 3,671,680.

Laporte Industries Limited: *See—*
Neumann, Barbara Susan, 3,671,190.

Larkin, Sam. Audio-video system employing sound track tape belts movably mounted on projection slides. 3,671,115, Cl. 353-19.000.

Larson, Floyd L.: *See—*
Davis, Louis E.; Jensen, Billy M.; Larson, Floyd L.; Huck, Rainer F.; and Stumph, Stephen L., 3,670,386.
Larson, Leland B.; and Clement, Clyde H., 33 1/3 to Shaheen, Eugene G. Key operated meter monitor. 3,670,959, Cl. 235-94.00r.
Larson, Willard D.: *See—*
Hartlein, Robert C.; Kiles, James D.; Larson, Willard D.; and Olson, Carl R., 3,670,649.
Laucks, F. Michael; and Vaughn, Robert S. Hermetic compressor. 3,671,147, Cl. 417-286.000.
Lauer, Walter W.: *See—*
Henley, Virgil E.; and Lauer, Walter W., 3,671,358.
Laufer, Robert J., to Consolidation Coal Company. Process for making thiophenol. 3,671,593, Cl. 260-609.00d.
Lawrence, Benjamin: *See—*
Wolfson, Alan B.; Patel, Jayantilal M.; and Lawrence, Benjamin, 3,671,262.
Lawrence, Howard; and Schaefer, Peter C., to General Electric Company. Three masking step process for fabricating insulated gate field effect transistors. 3,670,403, Cl. 29-571.000.
Layton, John E., to Boeing Company, The. Switched rhombic automatic direction finding antenna system and apparatus. 3,671,970, Cl. 343-120.000.
Le Bris, Louis; Michelet, Daniel; and Rakoutz, Michel, to Rhone-Poulenc S.A. Process for the preparation of quinones and hydroquinones. 3,671,552, Cl. 260-369.000.
Le Corre, Roger Jean: *See—*
Bruniaux, Bernard Jean Pierre Louis Lucien; and Le Corre, Roger Jean, 3,670,683.
Leach, David W.: *See—*
Johnson, Robert L.; and Leach, David W., 3,670,612.
Leak, Robert J.: *See—*
Schwager, Irving; Leak, Robert J.; and Cole, Edward L., 3,671,591.
Lear Siegler, Inc.: *See—*
Skalsey, Lily G., 3,670,625.
Leavitt, Clyde M.; Johnson, Walter C.; and Hall, Con C., IV, to Litton Systems, Inc. Method and apparatus for handling ships. 3,670,682, Cl. 114-45.000.
Leber, Don. Vehicle backing guidance device. 3,670,423, Cl. 33-46.0aa.
Lebrun, Guy: *See—*
Furstenberger, Jean; Lebrun, Guy; and Girault, Denis, 3,670,945.
Lee, Ernest O., Jr.; and Adams, John A., Jr., to Stromberg-Carlson Corporation. Outgoing register sender system. 3,671,677, Cl. 179-18.0da.
Lee, Shi K., to Boeing Company, The. Sense line coupling structures and circuits for magnetic memory devices. 3,671,951, Cl. 340-174.0sp.
Lee, Yoon Chai, to Monsanto Company. Method for impact modification of ethylenically unsaturated nitril polymers and polymer blends produced thereby. 3,671,607, Cl. 260-876.00r.
Lees, Wayne L., to United States of America, National Aeronautics and Space Administration. Method and apparatus for limiting field-emission current. 3,671,798, Cl. 313-336.000.
Leesona Corporation: *See—*
Richter, Hans H., 3,670,488.
Leffert, Charles B., to General Motors Corporation. Closed cycle vapor engine. 3,670,495, Cl. 60-25.000.
Lefferts, Peter, to Heinemann Electric Company, mesne. Control circuits. 3,671,780, Cl. 307-252.0ua.
Lefrancois, Philip A.; and Barclay, Kenneth M., to Pullman Incorporated. Purification of waste gases. 3,671,185, Cl. 23-2.00r.
Leger, James E., to United States of America, Air Force. Parachute force transfer mechanism with built-in open link. 3,670,999, Cl. 244-137.000.
Leiba, Eugene: *See—*
Assouline, George; Conjeaud, Pierre; Girault, Pierre; and Leiba, Eugene, 3,671,963.
Leistikow, Gerard K.: *See—*
Lemkin, Jack L.; Leistikow, Gerard K.; Edmisson, Russell C.; and Benson, John T., 3,670,449.
Leitz, Ernst, G.m.b.H.: *See—*
Bromer, Heinz; and Meinert, Norbert, 3,671,276.
Heitmann, Knut; and Schneider, Eckart, 3,671,750.
Holle, Werner; and Kessler, Arthur, 3,670,636.
Kessler, Arthur; and Loseries, Peter, 3,670,634.
Lemery, Jean-Paul, to Etablissements Carpano & Pons. Releasable pawl and ratchet mechanisms. 3,670,855, Cl. 188-82.300.
Lemery, Jean-Paul, to Carpano & Pons. SA. Line pick-up for fishing reels. 3,670,984, Cl. 242-84.20g.
Leming, John C., to Averton Gear and Tool Corporation. Long span screw and nut drives. 3,670,583, Cl. 74-89.15.
Lemkey, Franklin D.: *See—*
Thompson, Earl R.; and Lemkey, Franklin D., 3,671,223.
Lemkin, Jack L.; Leistikow, Gerard K.; Edmisson, Russell C.; and Benson, John T., to Mattel, Inc. Construction element toy. 3,670,449, Cl. 46-23.000.
Lemper, Herbert, to Mesta Machine Company. Vertical mill. 3,670,587, Cl. 72-239.000.
Lennert, Andrew E.; Crosswy, Frank L.; and Kalb, Henry T., to United States of America, Air Force. Reference time scale application to high speed film at high pulse repetition rates. 3,671,112, Cl. 352-84.000.
Leno, Theodore, to Teletype Corporation. Variable capacitive apparatus. 3,671,822, Cl. 317-249.00r.
Lent, William E.: *See—*
Gates, Louis E., Jr.; and Lent, William E., 3,671,275.
Leonard, Donald E., to Boeing Company, The. Winch apparatus for faired towline. 3,670,988, Cl. 242-158.00r.
Leopold, Richard F.: *See—*
Meier, Otto H.; and Leopold, Richard F., 3,670,863.
Lerch, Joseph Bryan: *See—*
Hampel, Daniel; and Lerch, Joseph Bryan, 3,671,783.
Lerouax, Robert K., to Hydril Company. Blowout preventer with resistance means between the body and the piston. 3,670,761, Cl. 137-315.000.
Leskovskaya, Nina Petrovna: *See—*
Lutchenkov, Anatoly Matveevich; Shekhodanov, Mikhail Petrovich; Siyanov, Sergei Alexandrovich; Korovin, Ivan Stepanovich; Kholstova, Nonna Alexandrovna; Kreptseva, Valentina Nikolaevna; and Leskovskaya, Nina Petrovna, 3,671,125.
Lesli Co.: *See—*
Muller, John T., 3,670,807.
Leutwein, Manfred; and Streicher, Heinz, to Eastman Kodak Company. Reader for information carriers in sheet form. 3,671,116, Cl. 353-27.000.
Levensohn, David Z.: *See—*
Duke, Bernard; and Levensohn, David Z., 3,671,151.
Leventhal, Howard L., to Ethyl Corporation. Bag. 3,670,953, Cl. 229-57.000.
Leventhal, Howard L., to Ethyl Corporation. Bag. 3,670,954, Cl. 229-57.000.
Lever Brothers Company: *See—*
Blake, Anthony; Halliday, Denis Malcolm; and Woods, Michael Faulkner, 3,671,268.
Carroll, Francis Emery; and Seebold, Walter Charles, 3,671,630.
Levi, George A., to Baker Perkins Inc. Layering device for cake. 3,670,665, Cl. 99-92.000.
Levin, Howard J.; and Kreider, Franklin M., to American Home Products Corporation. Container filling apparatus. 3,670,786, Cl. 141-92.
Levy, Alan A.; Rodger, Mitchell N.; and Breach, Geoffrey D., to Richardson-Merrell Limited. Sterilizing composition comprising potassium monopersulphate and sodium chloride coated with an edible oil and magnesium stearate. 3,671,629, Cl. 424-153.000.
Lewis, Herbert O.: *See—*
Rorick, William G.; and Lewis, Herbert O., 3,670,693.
Lewis, J. Stephen: *See—*
Groves, Sydney L.; Kuchta, Frank J.; Lewis, J. Stephen; Maurer, Donald J.; May, Richard L.; Ryan, John W.; and Vowles, Colin, 3,670,451.
Lewis, Joseph C., to North American Rockwell Corporation. Method of fabricating a laminated metal member. 3,670,397, Cl. 29-472.300.
Lewis, Robert V.: *See—*
Bahr, William T.; and Lewis, Robert V., 3,670,774.
Lewis, Thomas W., II: *See—*
Nell, David J.; and Lewis, Thomas W., II, 3,671,302.
Liard, Maurice. Stick for ice ball game. 3,671,038, Cl. 273-67.00r.
Liebe, Werner; Petersen, Siegfried; and von Konig, Anita, to Agfa-Gevaert Aktiengesellschaft. Silver salt diffusion process. 3,671,242, Cl. 96-29.000.
Liechti, Hans Wilhelm: *See—*
Artz, Klaus; Desai, Nalin Binduprasad; and Liechti, Hans Wilhelm, 3,671,177.
Lienemann, Darlo; and Henry, Daniel, to International Harvester Company. Planter. 3,670,671, Cl. 111-77.000.
Lietar, Christian: *See—*
Odone, Giovanni; and Lietar, Christian, 3,671,127.
Liggett, Thomas: *See—*
Cox, Charles D.; and Liggett, Thomas, 3,671,515.
Light, David J., to United States of America, National Aeronautics and Space Administration. Fixture for supporting articles during vibration tests. 3,670,563, Cl. 73-71.600.
Lilly, Eli, and Company: *See—*
Jackson, Billy G., 3,671,449.
Lindberg, Frank A., to United States of America, Navy, mesne. Method of making a circuit assembly. 3,670,396, Cl. 29-471.300.
Lindblom, Carl E.: *See—*
Heiss, Frederick H.; and Lindblom, Carl E., 3,670,785.
Lindgren, Per-Henning: *See—*
Brantte, Arnold; Frostling, Bengt Harald Ivar; and Lindgren, Per-Henning, 3,671,196.
Lindley, Ralph H.; and Bickham, Richard E., 1/2 to Pan American Petroleum Corporation; and and 1/2 to Petroleum Information Corporation. Analog to digital converter for well logs. 3,671,961, Cl. 340-347.0ad.
Lindsay, Douglas J., to Eastman Kodak Company. Means for indicating the length of roll film in a film cartridge for processing purposes. 3,670,638, Cl. 95-31.0ca.
Lindsay Specialty Products Limited: *See—*
Nepovim, Zdenek, 3,671,926.
Pennypacker, Frank C., 3,671,885.
Lindstrom, Eddie G., deceased: *See—*
Honnen, Lewis R.; Andrewsen, Harry W.; Lindstrom, Eddie G., deceased, 3,671,511.

Lion Fat & Oil Co., Ltd.: *See—*
Marumo, Hideo; Ninomiya, Morio; and Watanabe, Shinro, 3,671,504.

Liouville, Roger, to Herckelbout et Fils Societe Anonyme. Machine for the alternate cambering of a metallic thread. 3,670,781, Cl. 140-71.00r.

Lipp, James P.; and Jones, William H., to Honeywell Information Systems Inc., mense. Method and apparatus for detecting binary data by polarity comparison. 3,671,935, Cl. 340-146.1ab.

Littell, Harry E., Jr., to PPG Industries, Inc. Integral transparent safety glass armor unit. 3,671,370, Cl. 161-43.000.

Litton Systems, Inc.: *See—*
Leavitt, Clyde M.; Johnson, Walter C.; and Hall, Con C., IV, 3,670,682.

Littrell, Luther W., to Harris-Intertype Corporation. Sheet-gripper post formed by EDM. 3,671,706, Cl. 219-69.00m.

Lloyd, Adam J., deceased (by Lloyd, Leona A.; executrix). Plunger for bottle making machine. 3,671,211, Cl. 65-234.000.

Lloyd, James R., to Esso Production Research Company. Articulated structural support linkage. 3,670,515, Cl. 61-46.500.

Lloyd, Leona A.: *See—*
Lloyd, Adam J., deceased, 3,671,211.

Lo Monaco, Sergio; Guerrato, Alfredo; Fabbro, Dario; and Donadello, Graziello. Fluorocarbon-containing compounds and method of imparting oil-and water-repellency to textiles, paper, leather and the like. 3,671,493, Cl. 260-75.0nh.

Lockheed Aircraft Corporation: *See—*
Horowitz, Donald J., 3,670,426.

Loder, Edwin R.: *See—*
Sabatelli, Philip M.; Loder, Edwin R.; Brungs, Charles A.; and Sarge, Carmen R., 3,671,440.

Loft, John T.; Conciatori, Anthony B.; and Chenevey, Edward C., to Celanese Corporation. Random benzimidazole-benzoxazole copolymers and methods of preparation. 3,671,491, Cl. 260-47.0cp.

Lohmann, Albert, to Mannesmann-Meer Aktiengesellschaft. Nozzle construction for injection molding machines. 3,671,162, Cl. 18-30.0ns.

Lohr, James E., to Du Pont de Nemours, E. I., and Company. Process for the removal of ionic contaminants from an electrocoating bath. 3,671,412, Cl. 204-181.000.

London & Scandinavian Metallurgical Co., Limited: *See—*
Barrett, Ernest Charles Henry, 3,671,409.

Long, John A. Wood splitting apparatus. 3,670,789, Cl. 144-193.00d.

Long, William D.; Fell, Ferol S.; and Wells, Bernard L., 1/2 to Hesston Corporation; and and 1/2 to Field Queen Incorporated. Transmission for forage harvesters and the like. 3,670,590, Cl. 74-353.000.

Longacre, Andrew, Jr.: *See—*
Shapiro, Sidney; and Longacre, Andrew, Jr., 3,671,848.

Loofbourrow, Robert J., to Texaco Inc. Amplifier system. 3,671,931, Cl. 340-15.5gc.

Los, Marinus, to American Cyanamid Company. Substituted D-homoestra tetraene and pentaene compounds. 3,671,573, Cl. 260-488.0cd.

Loseries, Peter: *See—*
Kessler, Arthur; and Loseries, Peter, 3,670,634.

Louboutin, Robert, to Degremont, Societe Generale d'Epuration et d'Assainissement. Dielectrics for ozone-generating apparatuses. 3,671,417, Cl. 204-320.000.

Loughman, Joseph F., Jr.: *See—*
Rock, Edward M.; Loughman, Joseph F., Jr.; and Mc Manus, Ann, 3,670,872.

Loughran, Eugene F., Jr., to North American Philips Corporation. Rotary actuator and indicator. 3,671,900, Cl. 335-272.

Lovely, Walter G.: *See—*
Hoyt, Charles T.; Haun, John W.; Hensel, Dwight L.; Hansen, Clarence M.; Lovely, Walter G.; and Bruhn, Hjalmar D., 3,671,077.

Low, George M., Acting Administrator of the; National Aeronautics and Space Administration with (respect to an invention of); Stump, Eugene C., Jr.; and Rochow, Stephen Eugene, to N/A. Polyurethane resins from hydroxy terminated perfluoro ethers. 3,671,497, Cl. 260-77.5ap.

Lucas, Raymond L. R. Stack sensing sheet feed conveyor control means. 3,671,753, Cl. 250-222.00r.

Lucas, Robert, to Fives Lille-Cail. Crusher. 3,670,973, Cl. 241-188.00r.

Lucerne Products, Inc.: *See—*
Matthews, Benjamin H., 3,671,699.

Lucifer S.A.: *See—*
Stampfli, Harald, 3,671,009.

Luck, Friedrich, to Firma Wankel GmbH, and and Firma Borsig GmbH. Rotary piston compressor. 3,671,153, Cl. 418-61.000.

Luebcke, Enno: *See—*
Kaufman, Otto; Daeuble, Manfred; Witsch, Heinz-Guenter; Luebcke, Enno; and Bayew, Dimiter, 3,671,176.

Luisi, James A.: *See—*
Cassen, Quentin C.; Luisi, James A.; and Salman, Naif D., 3,671,948.

Lumenite Electronic Company: *See—*
Calabrese, Ronald V., 3,671,142.

Lummus Company, The: *See—*
Mascio, Nicholas E.; and Burke, Robert F., 3,671,197.

Lund, Svend Aage: *See—*
Knudsen, Erik Stenberg; Iversen, Svend Erik; Lund, Svend Aage; and Northeved, Allan, 3,671,858.

Lunt, Wilbur B.; and Haskell, Robert A., to United States of America, Navy, mesne. Self-powered fuze firing system. 3,670,653, Cl. 102-70.20r.

Lutchenkov, Anatoly Matveevich; Shekhodanov, Mikhail Petrovich; Siyanov, Sergei Alexandrovich; Korovin, Ivan Stepanovich; Kholstova, Nonna Alexandrovna; Kreptseva, Valentina Nikolaevna; and Leskovskaya, Nina Petrovna. Device for aligning prefabricated circuit with a photographic plate to make printed circuits. 3,671,125, Cl. 355-133.000.

Lutz, Karl-Anton, to Siemens Aktiengesellschaft. Circuit arrangement for the reception and forwarding of message signals in time division multiplex exchange stations. 3,671,674, Cl. 179-15.0at.

Lux, Foss Britton, to United States of America, Air Force. Obscuration delineation circuitry. 3,671,729, Cl. 235-186.000.

Lynch, Earl D., to Metal Products Corporation. Insulated panel. 3,670,466, Cl. 52-204.000.

Lynch, John F.; Scott, William Bryson; and Paoletti, Alfred J., to Marco-Development Co., Inc. Alloy, fusion overlay and process. 3,671,206, Cl. 29-196.600.

Lynch, John F.; Scott, William Bryson; and Paoletti, Alfred J., to Marco Development Co., Inc. Alloy, fusion overlay and process. 3,671,207, Cl. 29-196.600.

Lys, Jacques Francois Marie-Joseph. Anti-harmonic transformer. 3,671,901, Cl. 336-5.000.

Ma-Tran Corporation: *See—*
Huffaker, Walter D., 3,671,079.

Mac Donald, Ian Norman: *See—*
Fraser, William Milton; Cairns, Walter John; and Mac Donald, Ian Norman, 3,671,149.

MacDonald, John M.; and Campbell, Ian D., to Esso Research and Engineering Company. Stabilizing hydrocracked lubricating oils. 3,671,423, Cl. 208-97.000.

Maci, Raymond J., to General Motors Corporation. Brake pump air valve and cooling means. 3,670,854, Cl. 188-71.600.

Mack, Arthur F., Jr. Combined platform and step for boat transoms. 3,670,847, Cl. 182-92.000.

Mackin, Arthur S., to United States of America, Navy. Erasable holographic recording. 3,671,096, Cl. 350-3.500.

Mackin, John G., Jr.: *See—*
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Maeda, Tomosuke: *See—*
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Maekawa, Hiroshi; and Yamauchi, Choji, said Maekawa assor. to Giichi Okuno. Baths for activating the surface of plastics to be chemically metal-plated. 3,671,274, Cl. 106-1.

Maerker, Gerhard: *See—*
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Magdars, John T., to General Tire Extinguisher Corporation. Semiautomatic bose rack. 3,670,763, Cl. 137-355.180.

Maggio, Anthony F., Jr., to Honeywell Information Systems, Inc., mesne. Data message control system. 3,671,945, Cl. 340-172.500.

Maguire, Eileen; and Kadison, Leon A., to Crown City Plating Co. Preetch treatment of acrylonitrile-butadiene-styrene resins for electroless plating. 3,671,289, Cl. 117-47.00a.

Maher, Philip Kenerick; Albers, Edwin Wolf; and McDaniel, Carl Vance, to Grace, W. R., & Co. Preparation of high silica synthetic faujasite. 3,671,191, Cl. 023/113/000.

Maher, Robert J.: *See—*
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Mahon, Thomas J.; and Cherba, Samuel, to Becton, Dickinson and Company, mesne. Breathing circuit. 3,670,726, Cl. 128-188.000.

Mahorney, Kenneth R., to Danly Machine Corporation. Safety valve assembly for controlling clutch and brake in power press or the like. 3,670,767, Cl. 137-596.000.

Malekzadeh, Ali Asghar, to Master Specialties Company. Lamp failure detection circuit. 3,671,955, Cl. 340-251.000.

Maley, Gerald A.; and Walsh, James L., to International Business Machines Corporation. Ternary latches. 3,671,763, Cl. 307-209.000.

Maley, Gerald A.; and Walsh, James L., to International Business Machines Corporation. Auto-reset ternary latch. 3,671,764, Cl. 307-209.000.

Malkin, Irving; Palm, Bert E.; De Ridder, Jon A.; and Germano, Victor V., to Diamond Shamrock Corporation. Coated metal and method. 3,671,331, Cl. 148-6.200.

Mallet, Maurice: *See—*
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Malm, Robert E., to Northrop Corporation. Signal frequency synthesizer. 3,671,871, Cl. 328-25.000.

Mamiya, Shigeo; and Yajima, Ryoichiro, to Kabushiki Kaisha Saginomiya Seisakusho. Aging-proof humidity sensing element and method for the production thereof. 3,671,913, Cl. 338-35.000.

Manchester Liners Limited: *See—*
Clay, John Armstrong, 3,671,954.

Mancioli, Luciano. Beverage infusion apparatus, for example coffee. 3,670,641, Cl. 99-293.000.

Manes, Milton: *See—*
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Houlihan, William J.; and Manning, Robert E., 3,671,534.
Manning, Robert E., to Sandoz-Wander, Inc. Thiazolopyrimidines. 3,671,526, Cl. 260-25.00a.
Mansfield Sanitary, Inc.: *See—*
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Marand, Jean, to Ciba-Geigy Corporation. Non pressurized product dispensing system. 3,670,965, Cl. 239-308.000.
Marathon Electric Manufacturing Corporation: *See—*
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Marathon Oil Company: *See—*
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Marco-Development Co., Inc.: *See—*
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Marion, John P., to North American Rockwell Corporation. Spring leaf and method of making. 3,671,030, Cl. 267-54.000.
Markite Corporation: *See—*
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Marondel, Gunther: *See—*
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Marotte, Kenneth George Charles. Combination lock. 3,670,539, Cl. 70-299.000.
Marra, Alan A. Rigid composite products and process for the preparation thereof. 3,671,377, Cl. 161-162.000.
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Marsden, Sullivan S., Jr.; and Rose, Stephen C. Pipelining crude oils and tars containing dissolved natural gas at sub-freezing temperatures in order to avoid environmental damage. 3,670,752, Cl. 137-13.000.
Marshall, J. Howard, III; and Harrington, Timothy M., to Analog Technology Corporation. Frequency-programmed electron-capture detector. 3,671,740, Cl. 250-43.50r.
Martin, Frank C. Attachment for magnetic starters to protect three-phase electric motors. 3,671,808, Cl. 317-13.00r.
Martin, John Frank; and Ramsden, Charles Dean, to Fruehauf Corporation. Cargo container lifting and spacing apparatus. 3,671,069, Cl. 294-81.0sf.
Martin-Marietta Corporation: *See—*
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Martinetz, Johann, to Mayer & Cie, Firma. Needle track locking means for knitting machines. 3,670,526, Cl. 66-20.000.
Martini, Albert Michael, to Sel-Rex Corporation. Rhodium-platinum plating bath and process. 3,671,408, Cl. 204-43.000.
Martzloff, Francois D.: *See—*
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Marumo, Hideo; Ninomiya, Morio; and Watanabe, Shinro, to Lion Fat & Oil Co., Ltd. Method for electrostatically coating synthetic resin moldings. 3,671,504, Cl. 260-80.700.
Marwitz, Heinrich; and Nitzsche, Siegfried, to Wacker-Chemie G.m.b.H. Adhesive coatings comprising polysiboxanes. 3,671,485, Cl. 260-33.4sb.
Marzy, Otto, to Fischer, Georg, Aktiengesellschaft. Miltiple tool holder device. 3,670,608, Cl. 82-36.00a.
Maschinenfabrik Reinhausen Gebruder Scheubeck K.G.: *See—*
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Mascio, Nicholas E.; and Burke, Robert F., to Lummus Company, The. Treatment of pyrites. 3,671,197, Cl. 23-200.000.
Masek, Roland C., to United States of America, Navy. Magnetron rapid frequency changer. 3,671,801, Cl. 315-39.550.
Mason, Lawrence J.; Simpson, George R.; Paradysz, Louis F.; and Chen, Philip L., to Xerox Corporation. Recording apparatus. 3,670,633, Cl. 95-4.50r.
Masseth, Thomas J.: *See—*
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Master Specialties Company: *See—*
Malekzadeh, Ali Asghar, 3,671,955.
Masuda, Hiromasa; Nishigaki, Eiiti; and Maeda, Tomosuke, to Nippon Yushi Kabushiki Kaisha. Process for preparing resinous compositions. 3,671,496, Cl. 260-77.5cr.
Masuda, Kohei: *See—*
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Masuda, Noboru, to Denki Onkyo Co., Ltd. Contactless galvano-magnetro effect apparatus. 3,671,854, Cl. 323-94.00h.
Masuda, Yukio, to Kabushiki Kaisha Okuma Seisakusho. Control device for an electrically driven toy. 3,671,694, Cl. 200-81.00h.
Masuko, Fujio: *See—*
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Mateker, Emil J., Jr., to Western Geophysical Company of America. Method of seismographic exploration by measuring the attenuation coefficient in geologic section. 3,671,930, Cl. 340-15.500.
Mathis, Pierre, to Solvay & Cie. Process for recovering boron in products resulting from alkaline attack on borocalcic ores. 3,671,188, Cl. 23-59.000.
Matis, Imant Gustovich: *See—*
Bergmanis, Karlis Alfredovich; Klotinsh, Erik Ernestovich; and Matis, Imant Gustovich, 3,671,857.
Matsumoto, Seiji; Tamai, Yasuo; and Sto, Masamichi, to Xerox Corporation. Imaging system. 3,671,290, Cl. 117-37.0le.
Matsumura, Shigeru: *See—*
Kawakita, Takao; Ikeda, Hirosaka; Matsumura, Shigeru; and Taniguchi, Kunichiko, 3,671,300.
Matsumura, Yoshihiro, to Nippon Air Brake Company, Ltd. Brake pressure control system. 3,671,083, Cl. 303-21.0be.
Matsumura, Yutaka: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matsushita Electric Works, Ltd.: *See—*
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Matsushita Electronics Corporation: *See—*
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Matthews, Jamie F., Jr., to Esso Production Research Company. Method for subsurface flowline connection. 3,670,513, Cl. 61-72.300.
Matthews, Ralph W.; Bernhoft, Gerald W.; and Schmidt, Michael R., to Allis-Chalmers Manufacturing Company. Hydraulic row marker system. 3,670,823, Cl. 172-128.000.
Mattia, Michael, to Budd Company, The. Method of electroforming on surfaces having projections. 3,671,405, Cl. 204-4.000.
Mattia, Michael; and Van Sciver, Herbert D., II, to Budd Company, The. Method of joining dissimilar metals by plating. 3,671,406, Cl. 204-16.000.
Maurer, Donald J.: *See—*
Groves, Sydney L.; Kuchta, Frank J.; Lewis, J. Stephen; Maurer, Donald J.; May, Richard L.; Ryan, John W.; and Vowles, Colin, 3,670,451.
Mawhinney, Albert B.; and Herzog, Ellwood P., to General Motors Corporation. Method of reducing iron losses in the stator cores of alternating current machines. 3,670,407, Cl. 29-596.000.
Maxwell, Donald L.; and Nyberg, Philip E., to General Mills, Inc. Raisin coloring process. 3,671,265, Cl. 99-104.000.
May, Gordon Herbert, to International Business Machines Corporation. Roller structure for card reader. 3,671,719, Cl. 235-61.11d.
May, Richard L.: *See—*
Groves, Sydney L.; Kuchta, Frank J.; Lewis, J. Stephen; Maurer, Donald J.; May, Richard L.; Ryan, John W.; and Vowles, Colin, 3,670,451.
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Mazzarins, Janis, to General Motors Corporation. Scraper. 3,670,430, Cl. 37-127.000.
Mc Cabe, John P., to Instruments Systems Corporation, mesne. Electro-acoustic headset with ratchet. 3,671,685, Cl. 179-156.000.

Mc Intire, Hoy C.; and Vanorsdel, John R., to Battelle Development Corporation, The. Method of making high-density sintered metal. 3,671,228, Cl. 75-207.

Mc Lean, Robert E., to Rival Manufacturing Company. Can opener with a hand lever removable from the frame by the position of same. 3,670,410, Cl. 30-4.00r.

Mc Manus, Ann: *See*—
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McAlpin, Robert, Sir, & Sons Limited: *See*—
Eyre, Brian; and Bland, John, 3,671,075.

McCaffrey, Francis Hamnet Garland; McIndoe, Jack Garnett; and Rigg, Herbert, to Canadian Industries Limited. Shotshell wad. 3,670,650, Cl. 102-42.00c.

McCain, Lawrence G., to Coleman Company, Inc., The. Lamp assembly. 3,671,739, Cl. 240-122.000.

McCann, Paul A., Jr.: *See*—
Thompson, Harold W.; Smith, Harry W.; and McCann, Paul A., Jr., 3,671,943.

McDaniel, Carl Vance: *See*—
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McDowell-Wellman Engineering Company: *See*—
Cheek, Edward E., 3,670,870.

McFarlan, Alden I. Air conditioning system and method. 3,670,806, Cl. 165-22.000.

McFarland, Frederick R.; and Diffenderfer, Walter L., to K-D Manufacturing Company. Run out indicator for disc brake. 3,670,419, Cl. 33-172.00b.

McFarland, James D., Jr.: *See*—
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McGraw-Edison Company: *See*—
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La Sota, Leo S., 3,671,912.

McIlroy, Peter, II, to Robroy Industries. Adjustable clamp for elongated articles with transverse locking means. 3,670,369, Cl. 24-16.0pb.

McIndoe, Jack Garnett: *See*—
McCaffrey, Francis Hamnet Garland; McIndoe, Jack Garnett; and Rigg, Herbert, 3,670,650.

McIntosh, Harold A., to Robertshaw Controls Company. Electric motor control device. 3,671,838, Cl. 318-471.000.

McKay, Robert S.: *See*—
Meyer, Burton C.; and McKay, Robert S., 3,671,040.

McKeown, James E., to Bendix Corporation, The. Battery powered explosive system with relaxation oscillator in charging circuit. 3,671,842, Cl. 320-1.000.

McKibben, Charles W.; and Robinson, Robert C., to Union Carbide Corporation. Bubble-blending particulate solids. 3,671,018, Cl. 259-4.000.

McKinney, Emery L.: *See*—
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McLain, Charles D., to Olin Corporation. Copper base alloy. 3,671,225, Cl. 75-157.500.

McLean, William E.; and Ruch, David E., to General Motors Corporation. Method and apparatus for driving memory core selection lines. 3,671,949, Cl. 340-174.0tb.

McMenamy, Frederick; De More, Louis A.; and Del Mastro, Ludwig E., to North American Rockwell Corporation. Motor speed control with droop compensation. 3,671,835, Cl. 318-308.000.

McMullen, John J., Associates, Inc.: *See*—
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McMullen, John J., mesne: *See*—
Nonnecke, Ernst A., 3,670,517.

McNamee, Raymond W.; Mlynar, Lubomir; and Schachat, Norman, to Rohm & Haas Company. Mineral-coating compositions comprising an amine polymer and an amylaceous substance and papers coated therewith. 3,671,472, Cl. 260-17.4st.

McWhirter, John Ruben, to Union Carbide Corporation. Aerobic digestion of sludge with oxygen. 3,670,887, Cl. 210-5.000.

Meccanica: *See*—
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Meckler, Milton. Peltier effect concentric still with high temperature heat supplying means. 3,671,404, Cl. 202-176.000.

Medical Specialties, Inc.: *See*—
Gaylord, John F., Jr., 3,670,725.

Meditz, John A.: *See*—
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Medsker, Wayne G. Fluid mixing apparatus. 3,671,208, Cl. 48-180.00c.

Mehnert, Walter E.; and Heller, Horst A. Electric generator control system with radio feedback loop. 3,671,850, Cl. 322-28.000.

Meier, Emil S. Electrical power generator. 3,671,756, Cl. 290-54.000.

Meier, Ghert, to Contraves AG. Pneumatic warp thread monitoring apparatus. 3,670,778, Cl. 139-349.000.

Meier, Otto H.; and Leopold, Richard F., to General Electric Company. Endless conveyor system. 3,670,863, Cl. 198-22.00r.

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Meitner, Gary H., to Kimberly-Clark Corporation. Strong fire retardant webs. 3,671,303, Cl. 117-137.000.

Melle-Bezons: *See*—
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Meltzer, Robert I.; and Wittekind, Raymond R., to Warner-Lambert Company. 3,4,4a,9α-Tetrahydro-2-(1H)carbazolones. 3,671,544, Cl. 260-315.000.

Mentha, John William: *See*—
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Menzies, Robert W., to Canadian Patents and Development Limited. Synchronous reluctance motors having rotor segments of extended pole span. 3,671,789, Cl. 310-163.000.

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Shen, Tsung-Ying; and Dorn, Conrad P., Jr., 3,671,580.

Meredith, Curtis L.; and Von Bodungen, George A., to Copolymer Rubber & Chemical Corporation. Plastic composition and method of preparing same. 3,671,608, Cl. 260-878.00r.

Mergerian, Dickron: *See*—
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Merle, Roger: *See*—
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Mertens, William J., to Avco Corporation. Ammunition round. 3,670,651, Cl. 102-42.00c.

Mesta Machine Company: *See*—
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Metallschlauchfabrik Joseph Ulbrich & Co.: *See*—
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Metallurgicheskogo Mashinostroeniya: *See*—
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Metro, Stephen J.; and Shaub, Harold, to Esso Research and Engineering Company. Quinone phosphates as lubricant additives. 3,671,434, Cl. 252-49.800.

Metz, Jack L., to Teletype Corporation. Momentary multiple contact switch and operating key therefor. 3,671,700, Cl. 200-160.000.

Metzger, William J., to Midland-Ross Corporation. Car coupler. 3,670,901, Cl. 213-151.000.

Meyer, Burton C.; and McKay, Robert S., to Glass, Marvin, & Associates. Surface rebounding apparatus including ball, racket, and rebound surface. 3,671,040, Cl. 273-95.00r.

Meyer, Curtis E.: *See*—
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Meyer, Engelbert A., to USM Corporation. Fastener. 3,670,368, Cl. 24-73.000.

Meyer, Jurgen; and Sautter, Gerhard, to Siemens Aktiengesellschaft. Method and apparatus for automatic programmed control of a machine tool. 3,671,839, Cl. 318-571.000.

Meyer, Jurgen; and Sautter, Gerhard, to Siemens Aktiengesellschaft. Method and apparatus for adaptive control of a turning machine. 3,671,840, Cl. 318-571.000.

Michael, Jacob F., to Westinghouse Electric Corporation. Method of manufacturing an electric lamp filament having a coiled-coil body portion with oriented off-set legs. 3,670,377, Cl. 29-25.180.

Michel Lumber Company: *See*—
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Michel, Rupprecht, to Kraftwerk Union Aktiengesellschaft. Forced-flow boiler. 3,670,703, Cl. 122-406.00r.

Michelet, Daniel: *See*—
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Midland-Ross Corporation: *See*—
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Miles Laboratories, Inc.: *See—*
Van Dyke, John William, Jr.; and Van Laecke, Margaret Jo, 3,671,530.

Milessa, Aldo. Flexible rudder. 3,670,685, Cl. 114-162.000.

Miller, Calvin Max; and Sacks, Robert Charles, to Bell Telephone Laboratories, Incorporated. Coaxial cable with flat profile. 3,671,662, Cl. 174-28.000.

Miller, Carol K.: *See—*
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Miller, Dewitt H., to General Electric Company. Frequency transducer. 3,671,859, Cl. 324-78.00r.

Miller Engineering Corporation: *See—*
Miller, Frank H., Jr.; and Witherspoon, David L., 3,670,906.

Miller, Frank H., Jr.; and Witherspoon, David L., to Miller Engineering Corporation. Article loading system. 3,670,906, Cl. 214-6.00p.

Miller, Frederic L.: *See—*
Tribken, Everett R.; and Miller, Frederic L., 3,671,904.

Miller, Harmon B., to Reclosable Package Corporation. Package for sliced bacon. 3,671,271, Cl. 99-174.000.

Miller, Hugh L., to Northern Electric Company, Limited. Ultrasonic welding of thermoplastics. 3,671,366, Cl. 156-580.000.

Miller, Jerry B., deceased: *See—*
Bissonette, Vernon L.; Miller, Jerry B., deceased, 3,671,244.

Miller, Richard G.; and Cavitt, Roy L., to PPG Industries, Inc. Electroless process for forming thin metal films. 3,671,291, Cl. 117-54.000.

Miller, Stephen H., to Eastman Kodak Company. Cutting and splicing apparatus. 3,670,616, Cl. 83-397.000.

Milligan, Lee J., to Peripheral Systems Corporation. Control apparatus. 3,671,807, Cl. 317-11.00a.

Millman, Sidney E., to TRW Inc. Zero recovery time two transistor multivibrator. 3,671,774, Cl. 307-273.000.

Mills, Frank J.; Sadowski, John T.; Squires, Harwood H.; and Uebelhart, James J., to Sinclair-Koppers Company. Device for expansion of expandable polymer beads. 3,671,026, Cl. 263-21.00b.

Milner, Edwin Earl, Jr., to Baker Equipment Engineering Co., Inc. Aerial personnel platform with proximity sensing system. 3,670,849, Cl. 182-19.000.

Milo, August. Bracket for centering capped pipe in manholes. 3,670,384, Cl. 29-200.00j.

Milovac, Sidney: *See—*
Thomas, Michael D.; and Milovac, Sidney, 3,671,114.

Milton, Thomas J., to General Motors Corporation. Collapsible steering shaft assembly. 3,670,591, Cl. 74-492.000.

Minarik, Ronald W.: *See—*
Bozanic, Donald A.; Mergerian, Dickron; and Minarik, Ronald W., 3,671,855.

Miner, James E.: *See—*
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Minet, Albert Gustave. Machine for harvesting sugar cane. 3,670,481, Cl. 56-17.

Minnesota Mining and Manufacturing Company: *See—*
Sargent, Jerald P., 3,670,699.
Van Beusekom, Philip C., 3,671,236.

Minnesoto Mining and Manufacturing Company: *See—*
Constantine, Nikiforos, 3,671,744.

Minolta Camera Co., Ltd.: *See—*
Sugano, Shigeaki; and Uesugi, Kyozo, 3,671,109.

Minolta Camera Kabushiki Kaisha: *See—*
Murata, Tomoji; and Tanaka, Atsuyuki, 3,671,123.
Seino, Kuniki, 3,671,104.

Minsk, Louis Morton; Cohen, Hyman L.; and Frauenglass, Elliott, to Eastman Kodak Company. Polymeric hardeners containing aziridinyl units on the side chain. 3,671,256, Cl. 96-111.000.

Minton, Carl H. Method and apparatus for joining strip ends employing a stitcher assembly. 3,670,398, Cl. 29-505.000.

Miracle Pet Products, Inc.: *See—*
Duke, Bernard; and Levensohn, David Z., 3,671,151.

Mischutin, Vladimir, to Arkansas Company, Inc. Process for flameproofing and resultant product. 3,671,304, Cl. 117-136.000.

Mitchell, John E., to Hughes Aircraft Company. Intraconnector wiring change module. 3,671,918, Cl. 339-18.00r.

Mitchell, Kenneth A. Thermal container assembly. 3,670,918, Cl. 220-20.000.

Mitchell, Richard Frank, to U.S. Philips Corporation. Piezoelectric transducers having variable sensitivity between the boundaries of the piezoelectric crystal. 3,671,784, Cl. 310-9.500.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Kito, Katsumi, 3,670,862.
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Mitsubishi Paper Mills, Ltd.: *See—*
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Mitsubishi Petrochemical Co., Ltd.: *See—*
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Mitsubishi Seiko Kabushiki Kaisha: *See—*
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Mitsuhishi Denki Kabushiki Kaisha: *See—*
Nakata, Josuke; and Denda, Ryuji, 3,671,821.

Mittelstadt, Robert A. Releasable binding mechanism for skis. 3,671,054, Cl. 280-11.35m.

Mixon, Forest O.: *See—*
Orcutt, John C.; and Mixon, Forest O., 3,671,426.

Mixon, George A., to Mol-Pak Corporation. Frozen meat package. 3,671,272, Cl. 99-194.000.

Miyakawa, Tsuneaki: *See—*
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Miyamura, Tadao: *See—*
Fudemoto, Isao; Yoshibayashi, Tsutomu; and Miyamura, Tadao, 3,671,886.

Miyata, Yoshihiko: *See—*
Uchida, Atsuyoshi; and Miyata, Yoshihiko, 3,670,376.

Miyawaki, Saburo: *See—*
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Miyazaki, Masatoshi: *See—*
Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, 3,671,936.
Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, 3,671,937.
Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, 3,671,941.

Miyazawa, Shintaro: *See—*
Uchida, Naoya; Ohmachi, Yoshiro; Niizeki, Nobukazu; Miyazawa, Shintaro; and Iwasaki, Hiroshi, 3,671,103.

Mizumori, Haruhiko: *See—*
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Mizutani, Kazunori: *See—*
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Mizutani, Masayoshi: *See—*
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Mizutani, Toshio: *See—*
Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yositosi; and Fujimoto, Keimei, 3,671,548.

Mizzoni, Renat Herbert; and Blatter, Herbert Morton, to Ciba-Geigy Corporation. 6-Amino-3-pyridinesulfonamides. 3,671,512, Cl. 260-294.80f.

Mlynar, Lubomir: *See—*
McNamee, Raymond W.; Mlynar, Lubomir; and Schachat, Norman, 3,671,472.

Mobil Oil Corporation: *See—*
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Morrow, Terry R., 3,671,422.
Ruehle, William H.; Hodge, John D., Jr.; and Gray, William C., 3,671,929.

Mocas, Verlin A., to Richardson Company, The. Sealing assembly for storage batteries. 3,671,325, Cl. 136-178.000.

Mochizuki, Yoshifumi: *See—*
Takamune, Hirotoki; and Mochizuki, Yoshifumi, 3,670,492.

Moe, George, to McDonnell Douglas Corporation. Method for producing a water activatable battery. 3,671,318, Cl. 136-6.000.

Moeller & Neumann G.m.b.H.: *See—*
Grandmontagne, Walter, 3,670,864.

Mohir, Yoichi; and Ichimura, Hirohisa, to Nissan Motor Company, Limited. Control system for an automotive automatic power transmission. 3,670,598, Cl. 74-866.

Mol-Pak Corporation: *See—*
Mixon, George A., 3,671,272.

Molina, Orlando G., to North American Rockwell Corporation. Manufacturing a sensitive non-flammable dye penetrant. 3,671,183, Cl. 8-85.000.

Moller, Siegfried: *See—*
Rausch, Werner; Oei, Hans Young; and Moller, Siegfried, 3,671,332.

Monier Research & Development Pty. Ltd.: *See—*
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Monsanto Chemical Company: *See—*
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Moore, Arthur Ivan Walter; Porter, John Howard; Vearncombe, Richard Frank; and Reiher, Edward Karl. Face milling tool. 3,670,380, Cl. 29-105.000.

Moore, Christopher J.: *See—*
Kelly, John C.; and Moore, Christopher J., 3,670,843.

Moore, Robert E., to Sun Oil Company. Isomerization of cyclic hydrocarbons. 3,671,598, Cl. 260-666.00m.

Moore, Robert E., to Sun Research and Development Co. Oxidative dehydrogenation of multicyclic hydrocarbons. 3,671,599, Cl. 260-666.0py.

Moore, Robert E., to Sun Research and Development Co. Ethylation of adamantane nucleus with BF etherate. 3,671,600, Cl. 260-666.00m.

Moore, Werton Dewitt, to Delta Manufacturing and Engineering Corporation. Vehicle wheel washing apparatus. 3,670,743, Cl. 134-45.000.

Moorman Manufacturing Company: *See—*
Cory, Victor W.; Williams, Edgar E.; and Howard, Robert J., 3,670,702.

Moravsky, Vladislav Eduardovich; Vorona, David Solomonovich; and Shinkarenko, Boris Pavlovich. Apparatus for electric contact spot welding, preferably of small-size parts. 3,671,708, Cl. 219-78.000.

Mori, Chiharu; and Nakajima, Toru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic timing network for camera shutters. 3,670,637, Cl. 95-10.0ct.

Mori, Kazuhiro; Nakamura, Abio; Nakai, Miyoji; and Komisako, Tetuji, to Matsushita Electric Industrial Co., Ltd. Apparatus for producing open-topped hollow articles. 3,670,548, Cl. 72-187.000.

Mori, Toshiyuki: *See—*
Fukami, Masaharu; and Mori, Toshiyuki, 3,670,721.

Morin, Louis George: *See—*
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Moring, Peter Lothar Ernst: *See—*
Doyle, George Mitchel; Humphreys, Robert Eric; and Moring, Peter Lothar Ernst, 3,671,478.

Morisaki, Nobukazu, to Daido Metal Company Ltd. Top roller for spinning machine. 3,671,089, Cl. 308-20.000.

Morishita, Yasomatsu, to Kabushiki Kaisha Ryobi Seisakusho. Fishing reel. 3,670,985, Cl. 242-84.430.

Morley, Frederick William Walton; and Watts, Wilfred Thomas, to Rolls-Royce Limited. Improvements in or relating to bearings. 3,671,145, Cl. 417-247.000.

Morosawa, Teruo; to Tomy Kogyo co., Ltd. Toy assembly plant for vehicle. 3,670,450, Cl. 46-40.

Morris, David: *See—*
Barnes, Lell E.; and Morris, David, 3,671,810.

Morris, Philip, Incorporated: *See—*
Stahr, Henry M., 3,671,410.

Morrison, Walter C., to Harris-Intertype Corporation. Low sound level single facer machine. 3,671,361, Cl. 156-472.000.

Morrow, Terry R., to Mobil Oil Corporation. Water pollution abatement in a petroleum refinery. 3,671,422, Cl. 208-79.000.

Morsdorf, Manfred: *See—*
Gelderblom, Horst-Dieter; and Morsdorf, Manfred, 3,670,769.

Morvue, Inc.: *See—*
Kerr, James Richard, 3,671,726.

Mosier, Benjamin, to Esquire, Inc. Coated reflective surface and method of making same. 3,671,333, Cl. 148-6.270.

Mosley Electronics Company: *See—*
French, Gerald H., 3,671,973.

Moss, Harold S.: *See—*
Vogel, Ralph A.; and Moss, Harold S., 3,670,799.

Motoki, Masaya: *See—*
Kurita, Takaji; Motoki, Masaya; Emoto, Kazuhiro; and Hojo, Katsuo, 3,671,646.

Motorola, Inc.: *See—*
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Davis, Walter Richard, 3,671,767.
Frederiksen, Thomas M., 3,671,770.
Schuette, Gunter G., 3,671,805.

Motoyoshi, Minoru: *See—*
Kumai, Ko; Motoyoshi, Minoru; Tanaka, Kiyoshi; and Hagiwara, Yasuhira, 3,671,337.

Mott, George F.; and Ziober, Johnnie J., to Texaco Inc. Marine drilling structure with curved drill conductor. 3,670,507, Cl. 61-46.500.

Moulds, John W.: *See—*
Eckert, Clarence J.; and Moulds, John W., 3,670,709.

Moulin, Louis: *See—*
Aronica, Claude S.; and Moulin, Louis, 3,671,632.

Moyant, Donald A., to Atlas Chemical Industries, Inc. Explosively activated glass valve. 3,670,925, Cl. 222-3.000.

Moyer, Charles E., Jr., to Union Carbide Corporation. Lactam polymerization with allophanoyl halide initiators. 3,671,499, Cl. 260-78.00l.

Mueller, Arthur R., Jr. Stripping machine. 3,670,939, Cl. 225-99.

Mueller, Curt: *See—*
Altermatt, Rudolf; Entschel, Roland; and Mueller, Curt, 3,671,529.

Mukai, Hideo; and Wada, Kimihiro, to Nishimura Seisakusho Co., Ltd. Apparatus for controlling the contact pressure between a contact roller and a winding up roll in winders. 3,670,980, Cl. 242-67.100.

Muller, Erwin; and Bettini, Dino, to Siemens Aktiengesellschaft. Wiper and slip ring assembly. 3,671,791, Cl. 310-219.000.

Muller, Gerhard: *See—*
Neumann, Wolfram; Muller, Gerhard; Ranz, Erwin; Von Rintelen, Harald; and Schutz, Heinz Dieter, 3,671,252.

Muller, John T., to Lesli Co. Storage type hot water heating system. 3,670,807, Cl. 165-39.000.

Muller, Willy; and Robra, Helmut, to Schloemann Aktiengesellschaft. Ring-forging press. 3,670,557, Cl. 72-421.000.

Mulligan, William R. Magnetic sex-denoting ornament which attracts or repells respective similar ornaments denoting unlike or like sex. 3,670,525, Cl. 63-23.000.

Mundkur, Balaji, to University of Connecticut. Scanning apparatus for biological microdensitometry. 3,671,754, Cl. 250-236.000.

Murakami, Yoshio; Higashinakagawa, Iwao; Yasuda, Nobuaki; and Takeno, Syozo, to Tokyo Shibaura Electric Co., Ltd. method for manufacturing magnetic thin film element. 3,671,312, Cl. 117-212.000.

Murakami, Yukinobu: *See—*
Suzuki, Masaru; and Murakami, Yukinobu, 3,671,691.

Murata, Tomoji; and Tanaka, Atsuyuki, to Minolta Camera Kabushiki Kaisha. Device for insuring registration of the picture frame with the printing station in making prints from a film. 3,671,123, Cl. 355-97.000.

Murdock, John E., Jr. Golf tee setter-positioner. 3,671,037, Cl. 273-33.000.

Murphree, Francis J., to United States of America, Navy. Echo synthesizing apparatus. 3,671,657, Cl. 35-10.400.

Murphy, Donald P., to Hooker Chemical Corporation. Composition and process for stripping paint. 3,671,465, Cl. 252-548.000.

Murphy, John M.: *See—*
Fogt, Thomas H.; Steiner, William R.; and Murphy, John M., 3,670,523.

Murray, Edward J.; and Winstrom, Leon O., to Allied Chemical Corporation. Oxidation of cyclohexane. 3,671,588, Cl. 260-586.00b.

Murray, George L., Jr., to North American Rockwell Corporation. Electrostatic spinning head funnel. 3,670,486, Cl. 57-58.890.

Murray, James E.: *See—*
Foley, Richard G.; and Murray, James E., 3,671,827.

Muska, Allen V.: *See—*
Laird, William Burton; Williams, Roy L.; and Muska, Allen V., 3,671,022.

Muto, Iwao; Matsumura, Yutaka; Nishifjui, Katsuyuki; and Matsuura, Kenji, to Nippon Kokan Kabushiki Kaisha. Holding and follow-up mechanism for ultrasonic flaw detector. 3,670,562, Cl. 73-71.500.

N L Industries, Inc.: *See—*
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Nabisco, Inc.: *See—*
Griner, Arthur J.; and Blain, William A., 3,671,163.

Nachbur, Hermann; and Maeder, Arthur, to Ciba Limited. Phosphorus acid esters. 3,671,611, Cl. 260-932.000.

Nadherny, Rudolph E. Stop block assembly for railway car roller bearing journal box. 3,671,091, Cl. 308-40.000.

Nagamatsu, Hiroaki, to Toyo Kogyo Co., Ltd. Automatic transmission controls. 3,670,599, Cl. 74-869.000.

Nagano, Hideo. Electric connector. 3,671,924, Cl. 339-95.00d.

Nagao, Tetsuya. Nut and washer feeding device. 3,670,387, Cl. 29-211.00r.

Nagaoka, Koichi: *See—*
Fujimoto, Yasuo; Nagaoka, Koichi; Tatsukawa, Keizo; and Koiwa, Yoichi, 3,671,482.

Nagase, Sadao, to Mitsubishi Petrochemical Co., Ltd. Method of drawing thermoplastic synthetic resin film over a polyangular mandrel. 3,671,617, Cl. 264-89.000.

Nagase, Tsuneyuki: *See—*
Oshima, Teruo; Wada, Takeshi; Nagase, Tsuneyuki; Masuko, Fujio; Hirooka, Masaaki; and Taniguchi, Isoji, 3,671,506.

Nagumo, Sin-Ichi: *See—*
Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Sin-Ichi, 3,670,496.

Naismith, Thomas D.: *See—*
Brooks, Frank W.; and Naismith, Thomas D., 3,670,853.

Nakagawa, Fumio: *See—*
Hosokawa, Masuo; Yokoyama, Tohei; and Nakagawa, Fumio, 3,670,886.

Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; Yabuuchi, Hiroshi; and Takao, Hiroyoshi, to Sumitomo Chemical Company, Ltd. 1:1 Alternating copolymers of carbonyl or thiocarbonyl-containing non-conjugated compounds and conjugated compounds and method of preparation. 3,671,492, Cl. 260-85.5.

Nakai, Miyoji: *See—*
Mori, Kazuhiro; Nakamura, Abio; Nakai, Miyoji; and Komisako, Tetuji, 3,670,548.

Nakajima, Toru: *See—*
Mori, Chiharu; and Nakajima, Toru, 3,670,637.

Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Sin-Ichi, to Nissan Motor Company, Limited. Exhaust gas fater-burning system. 3,670,496, Cl. 60-29.00a.

Nakamura, Abio: *See—*
Mori, Kazuhiro; Nakamura, Abio; Nakai, Miyoji; and Komisako, Tetuji, 3,670,548.

Nakamura, Hiroto; Sato, Akira; and Doi, Ken-Ichi, to Matsushita Electronics Corporation. Shadow mask support mechanism for a color television image tube. 3,671,794, Cl. 313-85.00s.

Nakamura, Masanori: *See—*
Kometani, Yutaka; Tatemoto, Masayoshi; and Nakamura, Masanori, 3,671,510.

Nakamura, Michiei: *See—*
Terai, Shiro; Suzuki, Toshio; Hasegawa, Yoshihumi; Horiguchi, Shojiro; Nakamura, Michiei; Kimata, Shizuo; and Suzuki, Tadanobu, 3,671,476.

Nakano, Satoru, to Iwatani & Co., Ltd. Incinerator for waste oil and the like. 3,671,167, Cl. 431-190.000.

Nakao, Suekiti: *See—*
Shikata, Kazuo; Nakao, Suekiti; and Knomi, Katsutoshi, 3,671,466.

Nakata, Fusahide: *See—*
Nakata, Tozaburo, deceased, 3,671,616.

Nakata, Josuke; and Denda, Ryuji, to Mitsuhishi Denki Kabushiki Kaisha. Semiconductor controlled rectifier including two emitter regions. 3,671,821, Cl. 317-235.000.

Nakata, Toyozo. Flat armature moving coil electric meter. 3,671,862, Cl. 324-150.000.

Nakata, Tozaburo, deceased (by Nakata, Fusahide; heir). Method of manufacturing ball pens. 3,671,616, Cl. 264-68.000.

Nakayama, Kiyoshi; and Hagino, Hiroshi, to Kyowa Hakko Kogyo Kabushiki Kaisha. Preparation of L-isoleucine by fermentation. 3,671,396, Cl. 195-28.00r.

Nanko, Yoshiyuki: *See—*
Irie, Toshiaki; Sato, Katsuo; and Nanko, Yoshiyuki, 3,671,340.

Nardi, Giancarlo, to Compagnie Italiana Westinghouse Freni e Segnali. Fluid flow control device. 3,670,755, Cl. 137-81.500.

Naruse, Uhei: *See—*
Ayukawa, Yaichi; Naruse, Uhei; Itoh, Tadayoshi; and Miyakawa, Tsuneaki, 3,671,261.

Nash, John J., to Alsco, Inc. Rocket launcher fairing. 3,670,621, Cl. 89-1.800.

National Aeronautics and Space Administration with: *See—*
Low, George M., Acting Administrator of the; National Aeronautics and Space Administration with; Stump, Eugene C., Jr.; and Rochow, Stephen Eugene, 3,671,497.

National Cash Register Company, The: *See—*
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National Gypsum Company: *See—*
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National Nail Pty. Ltd.: *See—*
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National Research Corporation: *See—*
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National Research Development Corporation: *See—*
Singer, Alfred Richard Eric, 3,670,400.

National Starch and Chemical Corporation: *See—*
Brown, Gerald H.; and Mazzarella, Emil D., 3,671,310.

Nederlandsche Maatschappij voor Werken Buitengaats: *See—*
Van Der Wijden, Franciscus Theodorus Maria, 3,670,830.

Neff, Marten I. Method of adjusting a speaker of an electrical sound producing instrument. 3,670,841, Cl. 181-31.00r.

Nejedly, Peter T.: *See—*
Denoncourt, Gilles J.; and Nejedly, Peter T., 3,671,731.

Nell, David J.; and Lewis, Thomas W., II, to Dresser Industries, Inc. Impregnating porous ceramics with noncolloidal solids. 3,671,302, Cl. 117-123.00a.

Nelson, Vaughn A., to International Harvester Company. Fluid line coupling. 3,670,770, Cl. 137-614.040.

Nemoto, Kuniharu: *See—*
Tateno, Hideo; and Nemoto, Kuniharu, 3,671,339.

Nepovim, Zdenek, to Lindsay Specialty Products Limited. Coaxial cable connector. 3,671,926, Cl. 339-177.00e.

Nesbitt, Robert Dennis, to Compbell Manufacturing Company Limited. Composition comprising unsaturated elastomer, epoxy resin polycarboxylic acid or anhydride, cross-linking catalyst and filler and golf ball made therefrom. 3,671,477, Cl. 260-23.50a.

Neumann, Barbara Susan, to Laporte Industries Limited. Synthetic clay-like minerals of the smaltite type and method of preparation. 3,671,190, Cl. 23-111.000.

Neumann, Wolfram; Muller, Gerhard; Ranz, Erwin; Von Rintelen, Harald; and Schutz, Heinz Dieter, to Agfa-Gevaert Aktiengesellschaft. Photosensitive cyclic polyimides composition. 3,671,252, Cl. 96-90.000.

New Century Products, Inc.: *See—*
Blount, George W., 3,670,441.

Newell, Harold R., to Mesur-Matic Electronics Corporation. Fast rise time pulse generator. 3,671,777, Cl. 307-268.000.

Newell, Harold R., to Mesur-Matic Electronics Corporation. Stepping motor driver. 3,671,826, Cl. 318-138.000.

Newton, Alwin B., to Borg-Warner Corporation. Capacity control for multiple-phase ejector refrigeration systems. 3,670,519, Cl. 62-116.000.

Ngo, Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Gaseous display device. 3,671,938, Cl. 340-166.00r.

Nichicon Capacitor Ltd.: *See—*
Chiba, Minoru, 3,671,818.

Nickell, Louis G., to Hawaiian Sugar Planters' Association. Ripening of sugarcane by use of certain quaternary ammonium halides. 3,671,219, Cl. 71-121.000.

Nielsen, Hans, to Vald. Henriksen A/S. Apparatus for dyeing skeins of yarn. 3,670,532, Cl. 68-188.000.

Nielsen Hardware Corporation, The: *See—*
Swanson, Gunnar E., 3,670,371.

Niewolak, Ronald A. Bat and sphere game pieces. 3,671,039, Cl. 273-95.00r.

Niizeki, Nobukazu: *See—*
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Ninomiya, Morio: *See—*
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Nippon Air Brake Company, Ltd.: *See—*
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Nippon Cloth Industry Co., Ltd.: *See—*
Takenaka, Sadao; Kishida, Soichiro; and Yamazaki, Yoichi, 3,670,740.

Nippon Electric Co., Ltd.: *See—*
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Nippon Electric Company, Limited: *See—*
Irie, Toshiaki; Sato, Katsuo; and Nanko, Yoshiyuki, 3,671,340.
Kamoshida, Mototaka, 3,670,404.
Tateno, Hideo; and Nemoto, Kuniharu, 3,671,339.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Izuta, Tadao, 3,670,712.
Kita, Hidehiko, 3,671,660.
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Nippon Kogaku K.K.: *See—*
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Tomomitsu, Toshio; and Fujii, Tatsuo, 3,671,769.

Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Petroleum Refining Company: *See—*
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Nippon Piston Ring Kabushiki Kaisha: *See—*
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Nippon Steel Corporation: *See—*
Kumai, Ko; Motoyoshi, Minoru; Tanaka, Kiyoshi; and Hagiwara, Yasuhira, 3,671,337.

Nippon Telegraph and Telephone Public Corporation: *See—*
Uchida, Naoya; Ohmachi, Yoshiro; Niizeki, Nobukazu; Miyazawa, Shintaro; and Iwasaki, Hiroshi, 3,671,103.

Nippon Yushi Kabushiki Kaisha: *See—*
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Nippondenso Kabushiki Kaisha: *See—*
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Nischk, Gunther: *See—*
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Nishifjui, Katsuyuki: *See—*
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Nishigaki, Eiiti: *See—*
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Nishimaki, Ko; and Yoshikawa, Isamu, to Hitachi Shipbuilding and Engineering Co., Ltd. Storage tanks for ultra low temperature liquids. 3,670,917, Cl. 220-10.000.

Nishimura Seisakusho Co., Ltd.: *See—*
Mukai, Hideo; and Wada, Kimihiro, 3,670,980.

Nishimura, Tatsumi; Inoue, Tadahiko; Tsuboi, Takeo; and Kado, Masaru, to Kumial Chemical Industry Co., Ltd. 2-Methoxy-4-methylphenyl-N-methylcarbamate and insecticidal compositions containing the same. 3,671,640, Cl. 424-300.000.

Nishitani, Masaki: *See—*
Funakoshi, Yoshiro; Kajiura, Takehiko; Fujii, Kiyoshi; Kanamaru, Toshihiko; Nishitani, Masaki; and Komeda, Hiromu, 3,671,296.

Nissan Chemical Industries, Ltd.: *See—*
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Nissan Motor Company, Limited: *See—*
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Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Sin-Ichi, 3,670,496.

Nissho-Iwai Company Limited: *See—*
Terada, Manzo, 3,670,969.

Nitta, Yoshio, to Fuji Denki Seizo Kabushiki Kaisha. Power circuit breaker. 3,671,688, Cl. 200-48.00r.

Nitto Electric Industrial Co., Ltd.: *See—*
Yoshihara, Mitsuo; and Mizutani, Kazunori, 3,671,592.

Nitzsche, Siegfried: *See—*
Marwitz, Heinrich; and Nitzsche, Siegfried, 3,671,485.

Nixon, William Charles. Electron microscopy. 3,671,743, Cl. 250-49.50a.

Nonnecke, Ernst A., to McMullen, John J., mesne. Apparatus for cooling and filling liquefied gas transport and storage tanks and improvements in said tanks. 3,670,517, Cl. 62-45.000.

Norgren, C. A., Co.: *See—*
Dewberry, Albert W., 3,670,771.

Norris, Max E., to SCM Corporation. Hydrated emulsifier. 3,671,459, Cl. 252-356.000.

North American Philips Corporation: *See*—
Loughran, Eugene F., Jr., 3,671,900.
North American Rockwell Corporation: *See*—
Bernath, Louis; and Facha, Joseph V., 3,671,394.
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Lewis, Joseph C., 3,670,397.
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Molina, Orlando G., 3,671,183.
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Robinson, John F., 3,670,462.
Roper, Daniel W., 3,670,594.
North American Rockwell Corporation, mesne: *See*—
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North, Donald F., Jr.; Thomas, Jerry D.; and Worth, Gerald W., to Republic Steel Corporation. Methods of producing leaded steel. 3,671,224, Cl. 75-129.000.
Northern Electric Company Limited: *See*—
Dopheide, Otto Walter, 3,671,759.
Miller, Hugh L., 3,671,366.
Northeved, Allan: *See*—
Knudsen, Erik Stenberg; Iversen, Svend Erik; Lund, Svend Aage; and Northeved, Allan, 3,671,858.
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Alexander, Newton C.; Stark, Herbert; and Thornton, Richard C., 3,670,585.
Jeffries, Lester A., 3,671,795.
Malm, Robert E., 3,671,871.
Norton, Charles J.; and Falk, David O., to Marathon Oil Company. Oil recovery method using dispersion of clays in aqueous polyacrylamide solutions. 3,670,820, Cl. 166-305.00r.
Norton Company: *See*—
Christian, Warren E., 3,670,463.
Guinan, Joseph C., 3,671,364.
Nosal, Vsevolod Vladimirovich: *See*—
Tselikov, Alexandr Ivanovich; Nosal, Vsevolod Vladimirovich; and Verderevsky, Vadim Anatolievich, 3,670,549.
Nosler, Heinz Gunter; and Schnegelberger, Hararld, to Henkel & Cie G.m.b.H. Synergistic antibacterial and antifungal compositions of DMSO, ethanol or methanol and diester of 2,2,4-trimethylpentanediol-1,3. 3,671,654, Cl. 424-312.000.
Nothum, Andrew; Thomas, Billy W.; and White, Abram L., to Grover Machine Company. Tube bending machine. 3,670,553, Cl. 72-307.000.
Nussbaum, Frank J., to Bischoff Chemical Corporation. Low heat capacity mold for injection molding. 3,671,168, Cl. 425-242.000.
Nyberg, Philip E.: *See*—
Maxwell, Donald L.; and Nyberg, Philip E., 3,671,265.
Nye, William M.; and Jones, Stanley W., to Lanier Electronic Laboratory, Inc., mesne. Privacy of dictate stations using a recorder and selection of recorders by dictate stations while maintaining privacy. 3,671,680, Cl. 179-100.10r.
Nykopp, Erik A., to Oy Tampella AB. Paper machine including a horizontal suction forming cylinder having multiple dewatering areas thereon. 3,671,388, Cl. 162-304.000.
Oba, Harutaro; Sawazu, Toshihiko; Takeuchi, Sugio; and Chikata, Masaru, to Tokyo Electric Co., Ltd. Adding, subtracting and totaling calculator. 3,670,957, Cl. 235-60.0tn.
Oba, Shunzo: *See*—
Sasaki, Nobuyuki; Oba, Shunzo; and Yano, Tadashi, 3,671,915.
Oberhart, George S.: *See*—
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O'Connor, John J.: *See*—
Armington, Alton F.; and O'Connor, John J., 3,671,200.
Odone, Giovanni; and Lietar, Christian, to Paillard S.A. Light beam range-finder. 3,671,127, Cl. 356-4.000.
Oei, Hans Young: *See*—
Rausch, Werner; Oei, Hans Young; and Moller, Siegfried, 3,671,332.
Oftedahl, Edwin N.; Huttemann, Thomas J., Jr.; and Goffe, Charles A., to Eastman Kodak Company. Organic thioether or selenoether silver complexes as emulsion sensitizers. 3,671,260, Cl. 96-122.000.
Ogata, Kazuo; and Shimosato, Kazuo, to Teijin Limited. Process for the preparation of naththalene-2, 6-dicarboxylic acid. 3,671,578, Cl. 260-515.00p.
Ogawa, Yasuhiko: *See*—
Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, 3,671,936.
Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, 3,671,937.
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Imai, Atsuo; Harata, Mituo; Ogawa, Yoshitaka; and Hasegawa, Shoji, 3,671,324.
Ogua, Yukihiro, to Nippon Gakki Seizo Kabushiki Kaisha. Valve assembly for cornets, trumpets and like instruments. 3,671,011, Cl. 251-323.000.
O'Hanlon, John F.: *See*—
Haering, Rudolph R.; and O'Hanlon, John F., 3,671,820.
O'Hara, Joan Irenee; and Bradshaw, Christopher Patrick Cadman, to British Petroleum Company Limited, The. Disproportionation catalyst. 3,671,462, Cl. 252-429.00a.
Ohi, Reiichi: *See*—
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Ohmachi, Yoshiro: *See*—
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Ohno, Junji, to Nippon Gakki Seizo Kabushiki Kaisha. Key switch assembly for electronic musical instruments. 3,671,658, Cl. 84-1.010.
Ohno, Masao; and Kijima, Katsumi, to Nippon Kogaku K.K. Ultraviolet ray cutting pink glass for color photography. 3,671,277, Cl. 106-47.00q.
Ohya, Masaki: *See*—
Amagi, Yasuo; Ohya, Masaki; Shiiki, Zenya; and Yusa, Haruhiko, 3,671,610.
Ojala, William K., to Ford Motor Company. Integrated anti-stall and idle-speed adjustment mechanism. 3,670,708, Cl. 123-103.00e.
Okazaki, Takayoshi; Tashiro, Kiroku; and Yanagida, Koichiro, to Nissan Chemical Industries, Ltd. Method for producing flame-retardant plywoods. 3,671,376, Cl. 161-165.000.
Okner, Luke, to Standard Optical Mfg. Company. Biased hinge for spectacle frames. 3,671,111, Cl. 351-113.000.
Okuno, Yositosi: *See*—
Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yositosi; and Fujimoto, Keimei, 3,671,548.
Old Hickory Mfg. Co.: *See*—
Hosey, William F., 3,670,931.
Oldfield, Andrew H.; and Trott, Arthur F., to Senoptics, Inc. Tool positioning means for lens grinder. 3,670,460, Cl. 51-165.710.
Oles, Edward J., Jr.: *See*—
Hamilton, Colin B.; and Oles, Edward J., Jr., 3,671,407.
Olin Corporation: *See*—
McLain, Charles D., 3,671,225.
Olivotto, Vanfrido. Conveyor devices. 3,670,866, Cl. 198-33.0ac.
Olivotto, Vanfrido. Apparatus for collecting glass tubes at the end of a production line. 3,670,904, Cl. 214-1.00p.
Olofsson, Sten: *See*—
Ekdahl, Hans; and Olofsson, Sten, 3,670,842.
Olsen, Leif T., to Boen Bruk. Process for the continuous production of laminated wood of the parquet type. 3,671,353, Cl. 156-302.000.
Olson, Carl R.: *See*—
Hartlein, Robert C.; Kiles, James D.; Larson, Willard D.; and Olson, Carl R., 3,670,649.
Olson, John E.; Bostad, Wayne W.; and Price, Norman L., to Hyster Company. Jet pipe fluid control. 3,670,626, Cl. 91-3.000.
Olson, Peter B. Anti-theft apparatus for a motor vehicle. 3,670,837, Cl. 180-114.000.
Olympus Optical Co., Ltd.: *See*—
Fukami, Masaharu; and Mori, Toshiyuki, 3,670,721.
Kosaka, Shinya, 3,670,722.
O'Mara, Raymond D.; and Griffin, Charles K., to Carrier Corporation. Multicompartment pump structure. 3,671,136, Cl. 415-89.000.
Omark Industries, Inc.: *See*—
Pomeroy, Raymond Visher, 3,670,942.
Ong, Sienling: *See*—
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Onishi, Masayoshi: *See*—
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Ono, Isao; Fukabori, Kentaro; and Shimomura, Seiichi, to Toyo Soda Manufacturing Co., Ltd. Process for producing 1,4-diacyloxy-2-butene. 3,671,577, Cl. 260-497.00a.
Onsager, Olav Torgeir, to Halcon International, Inc. Production of adiponitrile. 3,671,567, Cl. 260-465.80d.
Onsager, Olav Torgeir, to Halcon International, Inc. Production of adiponitrile. 3,671,568, Cl. 260-465.80d.
Opalenik, John J. Single spring wire ground clip. 3,671,916, Cl. 339-14.00r.
Opuszenski, Theodore: *See*—
Rovin, Herman; Cobb, James W.; Opuszenski, Theodore; Willard, Richard H.; Rigat, Raymond, Jr.; and Pellicano, Joseph, 3,670,675.
Orcutt, John C.; and Mixon, Forest O., to Research Triangle Institute. Continuous filtering process. 3,671,426, Cl. 210-20.000.
Ormet Corporation: *See*—
Foley, Alan J.; and Gardner, Madison J., 3,671,204.
Ort, Wolfgang, to Eastman Kodak Company. Automatic shutter-speed control. 3,670,635, Cl. 95-10.00c.
Orth, Herbert: *See*—
Hoever, Heinz; and Orth, Herbert, 3,670,644.
Osaka Seiki Works, Ltd.: *See*—
Hori, Takashi, 3,670,461.
Osaka Soda Co., Ltd.: *See*—
Takikawa, Toshio; Satomo, Kouji; and Kodama, Takashi, 3,671,354.
Osburn, Myron E., deceased (by McDowell, Lennie; administratrix). Hold down clamp. 3,670,983, Cl. 242-74.200.
Oshima, Teruo; Wada, Takeshi; Nagase, Tsuneyuki; Masuko, Fujio; Hirooka, Masaaki; and Taniguchi, Isoji, to Sumitomo Chemical Company, Ltd. Sulfur curable copolymers of olefins. 3,671,506, Cl. 260-80.780.

Oshiro, George S. Pulse-phase comparators. 3,671,876, Cl. 328-134.000.

Oster Corporation: *See—*
Fuchs, Richard C.; Sukow, Daniel L.; and Wilke, Dennis P., 3,671,785.

Ott, Wolfgang: *See—*
Schilling, Werner; and Ott, Wolfgang, 3,671,166.

Ottinger, August F.; and Graham, Paul R., to Monsanto Company. Barrier coatings. 3,671,479, Cl. 260-29.6rw.

Otto, Rigobert; Pankow, Gerrit; De Cat, Artur Henri; Puschel, Walter; and Pelz, Willibald, to Agfa-Gevaert Aktiengesellschaft. Color silver halide photographic material containing yellow-colored magenta-forming color coupler. 3,671,257, Cl. 96-100.000.

Outboard Marine Corporation: *See—*
Arff, Uwe F., 3,670,600.
Evinrude, Ralph S., 3,671,071.

Overton, Harold L. Method for determining pressure conditions in a well bore from shale samples. 3,670,829, Cl. 175-50.000.

Owens-Illinois, Inc.: *See—*
Galeano, Sergio F., 3,670,968.
Phillips, Julius, 3,670,922.

Oy Tampella AB: *See—*
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Ozdian, Josef: *See—*
Brazda, Ladislav, deceased; Brazdova, Dagmar; heirs; Prochazka, Miloslav; Kuhn, Vladimir; Ozdian, Josef; and Benes, Rudolf, 3,670,484.

Ozutsumi, Minoru; Kawakami, Kazuo; Ishizaki, Sumio; and Kurosawa, Masatoshi, to Hodogaya Kagaku Kabushiki Kaisha. Process for the dyeing of cellulose diacetate fibers from basic dye baths containing sulfuric ester salts. 3,671,182, Cl. 8-170.000.

Padley & Venables Limited: *See—*
Eyre, Brian; and Bland, John, 3,671,075.

Paillard S.A.: *See—*
Odone, Giovanni; and Lietar, Christian, 3,671,127.

Pale Corporation: *See—*
Gandelman, Morris D., 3,670,373.

Palm, Bert E.: *See—*
Malkin, Irving; Palm, Bert E.; De Ridder, Jon A.; and Germano, Victor V., 3,671,331.

Palmer, John G.: *See—*
Belttary, Harold E.; and Palmer, John G., 3,671,908.

Pammer, Gottfried; and Krob, Erwin, to Vockenhuber, Karl; and and Hauser, Raimund. Strip-handling appliance for processing information. 3,670,990, Cl. 242-192.000.

Pan American Petroleum Corporation: *See—*
Duncan, Floyd R., 3,670,813.

Pan American Petroleum Corporation; and: *See—*
Lindley, Ralph H.; and Bickham, Richard E., 3,671,961.

Pangalila, Frans V. A., to McMullen, John J., Associates, Inc. Resilient roll controlling railway car side bearings. 3,670,661, Cl. 105-199.00a.

Panico, Joseph J., to Health Systems, Inc. Therapeutic instrumentation electrode. 3,670,736, Cl. 128-404.000.

Pankow, Gerrit: *See—*
Otto, Rigobert; Pankow, Gerrit; De Cat, Artur Henri; Puschel, Walter; and Pelz, Willibald, 3,671,257.

Panzer, Norman. Power-assisted inflation assembly for sphygmomanometers. 3,670,720, Cl. 128-2.05g.

Paoletti, Alfred J.: *See—*
Lynch, John F.; Scott, William Bryson; and Paoletti, Alfred J., 3,671,206.
Lynch, John F.; Scott, William Bryson; and Paoletti, Alfred J., 3,671,207.

Papenfuss, Theodor; and Spietschka, Ernst, to Farbewerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the preparation of very pure monosulfonic acids of triphenylmethane dyestuffs. 3,671,553, Cl. 260-392.000.

Papp, Josef, to Environetics, Inc. Method and means of converting atomic energy into utilizable kinetic energy. 3,670,494, Cl. 60-23.

Pappas, Michael, to Falcon Safety Products, Inc. Tilt-operated hand held gas powered acoustic device. 3,670,689, Cl. 116-112.000.

Paradysz, Louis F.: *See—*
Mason, Lawrence J.; Simpson, George R.; Paradysz, Louis F.; and Chen, Philip L., 3,670,633.

Paramount Textile Machinery Company: *See—*
Allison, Rudolph L., 3,670,860.

Paraskewik, William, to United States of America, Navy. Automatic sway brace device. 3,670,620, Cl. 89-1.50b.

Parke, Davis & Company: *See—*
Garland, Carl C., 3,670,865.
Islip, Peter John, 3,671,650.

Parker Pen Company, The: *See—*
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Parker, Wilbur: *See—*
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Parker, Wilbur Allen: *See—*
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Parker-Hannifin Corporation: *See—*
Brown, Carl A.; and Walter, Frederick L., 3,670,889.

Parkhill, Frank J.: *See—*
Brown, Albert B.; and Parkhill, Frank J., 3,671,305.

Parlato, Philip J., to Alarm Products International, Inc. Vibrating switch. 3,671,690, Cl. 200-61.45r.

Parry, James W. Bridle bit having improved mouthpiece mounting. 3,670,476, Cl. 54-8.000.

Partzsch, Peter, to Dornier A.G. Flight measuring apparatus. 3,670,569, Cl. 73-180.000.

Pasek, James E.; and Woodward, Charles D., to General Motors Corporation. Anti-lock brake modulator. 3,671,085, Cl. 303-21.00f.

Pasen, Randolph A.: *See—*
Elliott, Ernest A.; Kane, John W.; and Pasen, Randolph A., 3,671,002.

Passamante, Anthony P., to United States of America, Navy. Plasma arc flash source. 3,671,796, Cl. 313-204.000.

Patel, Jayantilal M.: *See—*
Wolfson, Alan B.; Patel, Jayantilal M.; and Lawrence, Benjamin, 3,671,262.

Patel, Jayantilal M.; and Wolfson, Anal B., to Procter & Gamble Company, The. Semi-continuous countercurrent decaffeination process. 3,671,263, Cl. 99-70.000.

Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH: *See—*
Schilling, Werner; and Ott, Wolfgang, 3,671,166.

Patsch, Manfred; and Eilingsfeld, Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Anthraquinone dyes. 3,671,536, Cl. 260-307.500.

Patterson, Robert W., to United States Steel Corporation. Apparatus for controlling weight and distribution of a coating. 3,670,695, Cl. 118-63.000.

Paulson, Allen E. Cycle counter for jet engines. 3,670,565, Cl. 73-117.300.

Pauly, Donald E., to Telemation, Inc. High frequency multiple phase signal generator. 3,671,872, Cl. 328-55.000.

Pavlik, Norman M., to Westinghouse Electric Corporation. Non-reactive refractory separating coatings for electrical steels. 3,671,335, Cl. 148-28.000.

Pavlov, Gely Georgievich: *See—*
Shalyt, German Mikhailovich; Sidorchuk, Svetlana Efimovna; and Pavlov, Gely Georgievich, 3,671,856.

Paymal, Jean, to Compagnie de Saint-Gobain. Continuous production of composite panels, particularly for buildings. 3,671,355, Cl. 156-324.000.

Peacock, Peter J.: *See—*
Tufts, Guy O.; Scarnato, Thomas J.; and Peacock, Peter J., 3,670,483.

Pearlman, Robert I.; executors: *See—*
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Pearo, Joseph J., to Diapulse Corporation. Thermapeutic apparatus ultra-short wave. 3,670,737, Cl. 128-422.000.

Pechiney-Progil: *See—*
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Peck, Donald E.: *See—*
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Peck, Reese A.: *See—*
Wilson, Raymond F.; Peck, Reese A.; and Guptill, Frank E., Jr., 3,671,420.

Peck, Reese A.; and Wilson, Raymond F., to Texaco Inc. Process for increasing the yield of lower boiling hydrocarbons. 3,671,421, Cl. 208-68.000.

Peddinghaus, Carl Ullrich. Bending machine. 3,670,541, Cl. 72-8.000.

Pedersen, George H., to General Motors Corporation. Jet nozzle. 3,670,964, Cl. 239-265.019.

Pekrul, Ewald, to Westinghouse Bremsen-und Apparatebau G.m.b.H. Variable load relay valve with Belleville spring type lock for exhaust valve seat positioned according to load. 3,671,087, Cl. 303-60.000.

Pellicano, Joseph: *See—*
Rovin, Herman; Cobb, James W.; Opuszenski, Theodore; Willard, Richard H.; Rigat, Raymond, Jr.; and Pellicano, Joseph, 3,670,675.

Peloschek, Hans Peter; and Perduijn, David Jacob, to U.S. Philips Corporation. Method of manufacturing a sintered oxidic ferromagnetic body. 3,671,436, Cl. 252-62.580.

Peluso, Raymond F.; and David, Richard F., to Martin-Marietta Corporation. High density packaging of electronic components in three-dimensional modules. 3,671,812, Cl. 317-118.000.

Pelz, Willibald: *See—*
Otto, Rigobert; Pankow, Gerrit; De Cat, Artur Henri; Puschel, Walter; and Pelz, Willibald, 3,671,257.

Penczek, Edward S., to Stromberg-Carlson Corporation. Electrical contact structure for a switch reed comprising gold and palladium layers. 3,671,702, Cl. 200-166.00c.

Penfold, Addison E., Jr., to Triple 'A' Accessories. Engine exhaust header construction. 3,670,844, Cl. 181-40.000.

Penning, Hans: *See—*
Wenzel, Werner; and Penning, Hans, 3,671,402.

Pennwalt Corporation: *See—*
D'Angelo, Antonio Joseph, 3,671,651.

Pennypacker, Frank C., to Lindsay Specialty Products Limited. High frequency signal routing devices for use in CATV systems. 3,671,885, Cl. 333-8.000.

Pento, Frank Louis, to Bell Telephone Laboratories, Incorporated. Digitally operated signal regenerator and timing circuit. 3,671,875, Cl. 328-129.

Pepe, Enrico J.; and Marsden, James G., to Union Carbide Corporation. Urea silicon product and the preparation thereof. 3,671,562, Cl. 260-448.80r.

Pera, John D.: *See—*
Buckman, John D.; Pera, John D.; and Raths, Fred W., 3,671,641.

Perduijn, David Jacob: *See—*
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Perilhou, Jean Robert; and Auphan, Michel Joseph, to U.S. Philips Corporation. Device for measuring the flow of blood. 3,670,715, Cl. 128-2.05v.

Peripheral Systems Corporation: *See—*
Milligan, Lee J., 3,671,807.

Perkins-Elmer Corporation, The: *See—*
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Perrat, Jean-Marie: *See—*
Prayer, Gerard; and Perrat, Jean-Marie, 3,670,919.

Peters, Edwin F.; and Juveland, Omar O., to Standard Oil Company (Indiana). Preparation of supported transition metal oxide polymerization catalysts. 3,671,432, Cl. 252-46.

Peters, Rudolph W. Pin cutter. 3,670,411, Cl. 30-180.000.

Petersen, Ross K. Cleaner. 3,670,480, Cl. 55-430.000.

Petersen, Siegfried: *See—*
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Petro-Tex Chemical Corporation: *See—*
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Petroleum Information Corporation: *See—*
Lindley, Ralph H.; and Bickham, Richard E., 3,671,961.

Pfaff Industriemashinen GmbH: *See—*
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Pfeiffer, Francis R.; and Weisbach, Jerry A., to Smith Kline & French Laboratories, Inc. 1,2-diacylglycerol 3-2,2,2-trichloroethyl carbonates. 3,671,557, Cl. 260-408.000.

Pfeiffer, Francis R.; and Weisbach, Jerry A., to Smith Kline & French Laboratories, Inc. Glycerol 3-(2,2,2-trichloroethyl) carbonate. 3,671,563, Cl. 260-463.000.

Pfizer, Inc.: *See—*
Abuel-Haj, Marwan J., 3,671,521.

Phillips, Julius, to Owens-Illinois, Inc. Nestable cup. 3,670,922, Cl. 220-97.00c.

Phillips Petroleum Company: *See—*
Fahey, Darryl R., 3,671,560.
Smith, Ernest L., 3,670,951.

Phillips, William A., to Granco Equipment, Inc. Incinerator with extended heat exchange surface. 3,670,668, Cl. 110-8.

Photosystems Corporation: *See—*
Fouquart, John, 3,671,745.

Piepho, Donald A.: *See—*
Asal, Jerrold R.; and Piepho, Donald A., 3,670,825.

Pierce, Andrew Earl, to Borden, Inc. Water and heat resistant adhesive. 3,671,382, Cl. 161-214.000.

Pierce, Edwin A.; Knob, Richard W.; Roth, Samuel O.; and McKinney, Emery L., to Inland Systems, Inc. Wall covering applicator. 3,671,362, Cl. 156-552.000.

Pierce, Norwin Caley: *See—*
Evans, Evan Franklin; and Pierce, Norwin Caley, 3,671,379.

Pierno, Michael C.; and Figas, Vincent J. Small engine service center. 3,670,762, Cl. 137-342.000.

Pilato, Maurice J. M., to Collet, Marc Norbert. Electronic device for plane graphical representation with perspective effect. 3,671,730, Cl. 235-189.000.

Piller, Bernhard: *See—*
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Pilot Research Corporation: *See—*
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Pincus, Alexis G.: *See—*
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Pioneer Electronic Corporation: *See—*
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Pistor, Hans Joachim: *See—*
Decker, Martin; Schmidt, Joseph; Hoffmann, Herwig; and Pistor, Hans Joachim, 3,671,566.

Pitetti, Raymond Charles; and Worobey, Walter, to Bell Telephone Laboratories, Incorporated. Thin film capacitor including an aluminum underlay. 3,671,823, Cl. 317-258.000.

Plate, Dr., GmbH: *See—*
Uhrig, Wilhelm, 3,671,284.

Pless, Uwe, to U.S. Philips Corporation. Etchant for selectively etching patterns in thin silicon dioxide layers and method of preparing such an etchant. 3,671,437, Cl. 252-79.300.

Plowman, James S., to United Aircraft Corporation. Composite blade construction. 3,671,139, Cl. 416-61.000.

Pohl, Harold J.; and Kratky, Raymond H., to Kellwood Company. Tent with permanently attached fly. 3,670,747, Cl. 135-1.00r.

Polaroid Corporation: *See—*
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Land, Edwin H., 3,671,241.

Pollak, Henry M.; and Pollak, Robert S. Arbor saw. 3,670,788, Cl. 143-36.00r.

Pollak, Robert S.: *See—*
Pollak, Henry M.; and Pollak, Robert S., 3,670,788.

Pomeroy, Raymond Visher, to Omark Industries, Inc. Automatic feeding of fasteners. 3,670,942, Cl. 227-10.000.

Pomper, Anthony W.; and Kovacs, Lloyd, to Midland-Ross Corporation. Extruder and screw therefor with undercut melt conducting channel. 3,671,021, Cl. 259-109.000.

Pope, Raymond C.: *See—*
Conrad, Ludas J.; and Pope, Raymond C., 3,670,882.

Portain Poclain Materiel: *See—*
Cheze, Bernard J., 3,670,465.

Porter, Allan William Henry, to Adolph Saurer Ltd. Braking shuttles in loom shuttle box. 3,670,775, Cl. 139-185.000.

Porter, Andrew W.; and Sanders, John L., to Canadian Patents and Development Limited. Veneer machine roller pressure bar assembly. 3,670,790, Cl. 144-213.000.

Porter, John Howard: *See—*
Moore, Arthur Ivan Walter; Porter, John Howard; Vearncombe, Richard Frank; and Reiher, Edward Karl, 3,670,380.

Porter, Warren K., Jr., to Gulf Research & Development Company. Method of making stable, low viscosity wax-in-water emulsions. 3,671,457, Cl. 252-311.500.

Post, Harold N.: *See—*
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Potter, Jack D.; and Reams, Bernard W., to Warren Petroleum Corporation. Rising stem valve remote position indicator. 3,671,692, Cl. 200-61.860.

Poulsen, Stephen D., Jr., to Airco, Inc. Break seal. 3,670,914, Cl. 215-32.000.

Power Technology Corporation: *See—*
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PPG Industries, Inc.: *See—*
Cuevas, Ephraim A., 3,671,187.
Littell, Harry E., Jr., 3,671,370.
Miller, Richard G.; and Cavitt, Roy L., 3,671,291.
Tarnopol, Milton S.; and Snyder, Thomas P., 3,671,311.

Prangley, Dale L.: *See—*
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Prayer, Gerard; and Perrat, Jean-Marie, to Cebal GP. Easy opening lid for cans. 3,670,919, Cl. 220-54.000.

Prenco Manufacturing Co.: *See—*
Herman, James A., 3,670,666.

Prescott, Roger, to Great Lakes Carbon Corporation. Composites and intermediates therefor. 3,671,285, Cl. 117-75.000.

Price, Herbert K., to Reynolds Metals Company. Method of making a composite board product from scrap materials. 3,671,615, Cl. 264-39.000.

Price, Norman L.: *See—*
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Prill, Erhard J., to Monsanto Company. Method of inhibiting growth of unwanted vegetation. 3,671,218, Cl. 71-115.000.

Pripeton, George: *See—*
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Prochazka, Miloslav: *See—*
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Procter & Gamble Company, The: *See—*
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Tselikov, Alexandr Ivanovich; Nosal, Vsevolod Vladimirovich; and Verderevsky, Vadim Anatolievich, 3,670,549.

Pronovost, Charles F.; and Prangley, Dale L. Automobile accessory holder. 3,670,936, Cl. 224-42.420.

Proudian, Andrew Peter; and Balser, Martin, to Xonics Inc. Aircraft vortex detection system. 3,671,927, Cl. 340-1.00r.

Pucher, Richard A.: *See—*
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Pullman Incorporated: *See—*
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Puschel, Walter: *See—*
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Quain, Wilbur C., to Lake Center Industries. Control regulator. 3,670,757, Cl. 137-103.000.

Quinn, John N., 1/2 to Johnson Welding & Equipment Co., Inc. Crushing plant. 3,670,972, Cl. 241-76.000.

Raab, Harry F., Jr.: *See—*
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Rabenhorst, David W.; and Darnell, Kenneth E., to United States of America, Navy. Rapid deployment corner reflector. 3,671,965, Cl. 343-18.00c.

Radke, Lawrence F.; and Hobbs, Peter V., to Battelle Development Corporation. Automatic cloud condensation nuclei counter. 3,671,128, Cl. 356-37.000.

Radosavljevic, Svetislav M.; and Maniotes, John. Slide rule. 3,670,958, Cl. 235-70.00a.

Rafaut & Cie: *See—*
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Raffensperger, Stanley P.: *See—*
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Rahenkamp, Robert A.; and Stewart, William R., Jr., to International Business Machines Corporation. Sentence oriented dictation system featuring random accessing of dictation segments. 3,671,683, Cl. 179-100.2md.
Raiguel, William M., Jr., to Creswell, Samuel J., Iron Works, The. Prefabricated metal stairway. 3,670,848, Cl. 182-115.000.
Rakes, Rodney G., to Sperry Rand Corporation. Bi-level electronic switch in a brushless motor. 3,671,833, Cl. 318-254.000.
Rakoutz, Michel: *See—*
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Ramusino, Francesco Cotta: *See—*
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Rand, Walter Leslie; and Simmons, John Ernest, to EMI Limited. Moulding of gramophone records. 3,671,158, Cl. 425-129.000.
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Raths, Fred W.: *See—*
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Rauhut, Michael McKay; and Semsel, Andrew Milo, to American Cyanamid Company. Chemiluminescent compositions. 3,671,450, Cl. 252-186.000.
Rausch, Werner; Oei, Hans Young; and Moller, Siegfried, to Hooker Chemical Corporation. Metal treating process. 3,671,332, Cl. 148-6.17.
Ravve, Abraham; and Khamis, Joseph T., to Continental Can Company, Inc. Process for preparing carboxyl acid containing olefin polymer surface coatings using high energy ionizing radiation. 3,671,295, Cl. 117-93.310.
Ray, James D.; Steingiser, Samuel; and Cass, Robert A., to United States of America, Air Force. Treatment of carbon or graphite fibers and yarns for use in fiber reinforced composites. 3,671,411, Cl. 204-130.000.
Raznitsyn, Mikhail Alexeevich. Method of electroerosion machining of parts and device for effecting same. 3,671,705, Cl. 219-69.00c.
Razzano, John S.: *See—*
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RCA Corporation: *See—*
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Jonsson, Kurt Alfred, 3,671,220.
Redman, John Wilson: *See—*
Boroughs, Raymond Milton; and Redman, John Wilson, 3,670,888.
Reed, Geoffrey Ronald, to British Iron and Steel Research Association, The. Packaging coils. 3,670,877, Cl. 206-59.00f.
Reeve, Paul H., to Auto Research Corporation. Pump priming and flow control valve for pumping two different fluids. 3,671,148, Cl. 417-295.000.
Regan, Bernard M., to Baxter Laboratories, Inc. Method for inducing anethesia. 3,671,645, Cl. 424-351.000.
Regie Nationale des Usines Renault: *See—*
Falay, Bernard; and Froumajou, Armand, 3,670,586.
Reicheneder, Franz; and Kropp, Rudolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Pyridazonium compounds. 3,671,525, Cl. 260-250.00a.
Reid, Edward A., Jr., to Columbia Gas System Service Corporation. Deep fat fryer. 3,671,174, Cl. 431-326.000.
Reiffel, Leonard. Teaching system employing a television receiver. 3,671,668, Cl. 178-6.800.
Reiher, Edward Karl: *See—*
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Reimer, William A., to GTE Automatic Electric Laboratories, Incorporated. Planar receptacle. 3,670,409, Cl. 29-625.000.
Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Readily alterable wover-wire magnetic memory unit. 3,671,950, Cl. 340-174.0sp.
Reinhardt, Dieter: *See—*
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Reinhardt, Robert L., to Clark Equipment Company. Implement load transfer. 3,670,822, Cl. 172-7.000.
Reist, Walter, to Ferag AG. Conveyor apparatus. 3,671,035, Cl. 271-76.
Reiterman, Donald R., to American Hospital Supply Corporation. Medical infusion set. 3,670,727, Cl. 128-214.00r.
Renskers, John O., to Coilcraft, Inc. Internally polygonal coil form. 3,671,905, Cl. 336-136.000.
Republic Industries Inc.: *See—*
Slaybaugh, Loren E., 3,670,455.
Republic Steel Corporation: *See—*
North, Donald F., Jr.; Thomas, Jerry D.; and Worth, Gerald W., 3,671,224.
Research Triangle Institute: *See—*
Orcutt, John C.; and Mixon, Forest O., 3,671,426.
Ress, Thomas I. High-frequency communication system. 3,671,675, Cl. 179-15.0fd.
Reuben, Bertie J.: *See—*
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Richardson, Charles D., to Richardson Service, Inc. Method and apparatus for fiberizing molten mineral materials. 3,671,210, Cl. 65-5.000.
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Rienzi, Dominick. Punch stripper. 3,670,613, Cl. 83-139.000.
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Ritzow, Gerald R., to Cutler-Hammer, Inc. Time delay control system for directional relays with electrical interlock. 3,671,816, Cl. 317-136.000.
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Mc Lean, Robert E., 3,670,410.
Robbins, James L., to Brooks Products, Inc. Press forming machine. 3,671,156, Cl. 25-45.000.
Roberts, Edward S., to Treadwell Corporation. Sulfur dioxide conversion. 3,671,194, Cl. 23-176.000.
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Robinson, John F., to North American Rockwell Corporation. Lapping of ball bearing raceway. 3,670,462, Cl. 51-291.000.
Robinson, Ralph R. Vacuum curette. 3,670,732, Cl. 128-297.000.
Robinson, Robert C.: *See—*
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Rock, Edward M.; Loughman, Joseph F., Jr.; and Mc Manus, Ann, to Harcourt Brace Jovanovich, Inc. Combination carrying carton and display stand. 3,670,872, Cl. 206-44.00r.
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Rorick, William G.; and Lewis, Herbert O., to Collins Radio Company. Quartz crystal resonator tuning control apparatus. 3,670,693, Cl. 118-5.000.
Rose, Anthony T. Surgical instrument. 3,670,415, Cl. 30-349.000.
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Rosenberg, Karl Moses, to Flo-Tech Corporation, mesne. Method and apparatus for applying decorative coating to a substrate. 3,671,288, Cl. 117-39.000.
Ross, Ray C.; and Crum, Robert L., to Allis-Chalmers Manufacturing Company. Hinged closure for vehicle bottom guard structure. 3,670,835, Cl. 180-691.000.
Rossi, Harry J., to Continental Can Company, Inc. Tubular carton with axially closed ends. 3,670,950, Cl. 229-40.000.
Roszinski, Hilmar; and Harnisch, Heinz, to Knapsack Aktiengesellschaft. Process for the manufacture of ammonium dialkyldithiophosphates. 3,671,612, Cl. 260-987.000.
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Rotter, Johann. Optical device having two parts producing fixed intermedial image. 3,671,098, Cl. 350-8.
Rovin, Herman; Cobb, James W.; Opuszenski, Theodore; Willard, Richard H.; Rigat, Raymond, Jr.; and Pellicano, Joseph, to Ivanhoe Research Corporation. Method and system for attaching a pocket to a portion of a garment. 3,670,675, Cl. 112-121.120.
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Rowley, Ernest W. Boat having pivotally mounted steering mechanism. 3,670,687, Cl. 115-18.000.
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Rubino, Joseph. Golf tee setter. 3,671,036, Cl. 273-33.000.
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Ruehle, William H.; Hodge, John D., Jr.; and Gray, William C., to Mobil Oil Corporation. Conversion of seismic depth sections to seismic time sections. 3,671,929, Cl. 340-15.500.
Ruland, Ross R.: *See—*
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Rutherford, Kenneth R.; Hooker, Marvin L., Jr.; and Alibrandi, Joseph P., to Collins Radio Company. Pulse processing circuit having improved range resolution. 3,671,866, Cl. 325-322.000.
Rutledge, Thomas F., to Atlas Chemical Industries, Inc. Catalytic copolymerization of acetylene and monoolefins. 3,671,604, Cl. 260-677.000.
Ryan, John T.; and Ingalls, Jeffrey D., to GTE Sylvania Incorporated. Ground fault detector including magnetic amplifier bridge means. 3,671,809, Cl. 317-18.00d.
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Sabatelli, Philip M.; Loder, Edwin R.; Brungs, Charles A.; and Sarge, Carmen R., to Chemed Corporation. Process of cleaning. 3,671,440, Cl. 252-103.000.
Sachs, Roger Norman, to National Nail Pty. Ltd. Fence dropper. 3,671,017, Cl. 256-47.000.
Sacks, Robert Charles: *See—*
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Sadogierski, Walter C., to Guardian Electric Manufacturing Company. Push button switch assembly with improved discrete and identical geometric shaped interlocking slider means. 3,671,686, Cl. 200-5.0ea.
Sadowski, John T.: *See—*
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Baerg, William; and Saint Guilhem Humber, Pierre, 3,670,892.
Saito, Masahiro. Engine with an annular chamber. 3,670,705, Cl. 123-8.470.
Saito, Takao: *See—*
Uchida, Hiromu; Umezono, Akimi; Saito, Takao; and Enari, Tsutomu, 3,671,205.
Sakata, Rikita; Masuda, Kohei; and Takashi, Masanor, to Mitsubishi Petrochemical Co., Ltd. Laminated biaxially oriented isotactic polypropylene and uniaxially oriented ethylene-propylene-film. 3,671,383, Cl. 161-252.000.
Sakurai, Moritaro: *See—*
Yamada, Yoshitaka; Sakurai, Moritaro; and Kumashiro, Izumi, 3,671,649.
Salihi, Jalal T., to General Motors Corporation. Suppression of torque modulation in electric motor drive systems by frequency control. 3,671,832, Cl. 318-231.000.
Salman, Naif D.: *See—*
Cassen, Quentin C.; Luisi, James A.; and Salman, Naif D., 3,671,948.
Saltzberg, Burton R., to Bell Telephone Laboratories, Incorporated. Digital filter frequency-shift modulator. 3,671,670, Cl. 178-67.
Samcoe Holding Corporation: *See—*

Cohn, Eugene; Cecere, Andrew P.; and Frezza, Robert, 3,670,375.
Samour, Carlos M.; and Falxa, Martin L., to Kendall Company, The. Betaine copolymers with hydroxyalkylacrylates and hydroxyalkylmethacrylates. 3,671,502, Cl. 260-79.3mu.
Sampson Corporation, The: *See—*
White, Norman S., 3,670,730.
Sanchez, Moises G.: *See—*
Triggiani, Leonard V.; and Sanchez, Moises G., 3,671,453.
Sanders, Bobby J., to Bendix Corporation, The. Superregenerative microwave receiver. 3,671,868, Cl. 325-445.000.
Sanders, James W., to Brunswick Corporation. Golf game computer including means for approximating the effects of backspin on range. 3,671,724, Cl. 235-151.000.
Sanders, John L.: *See—*
Porter, Andrew W.; and Sanders, John L., 3,670,790.
Sanderson, Charles L.; and Sauer, Earl S., to Continental Oil Company. Process for the purification of alkylate. 3,671,601, Cl. 260-671.00b.
Sandler, Yehuda L., to Westinghouse Electric Corporation. Hydrophobic layers for gas diffusion electrodes. 3,671,323, Cl. 136-86.00d.
Sandoz A.G.: *See—*
Bormann, Gerhard; Gmunder, John; and Wilkens, Heinrich, 3,671,541.
Sandoz Ltd.: *See—*
Altermatt, Rudolf; Entschel, Roland; and Mueller, Curt, 3,671,529.
Forter, Willy; Henrard, Armand; Kehrer, Fritz; Keller, Urs Martin; and Wasem, Hans, 3,671,514.
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Sandoz Ltd.; a/k/a: *See—*
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Houlihan, William J.; and Manning, Robert E., 3,671,533.
Houlihan, William J.; and Manning, Robert E., 3,671,534.
Manning, Robert E., 3,671,526.
Sangster, Frederik Leonard Johan, to U.S. Philips Corporation. Charge amplifier for a bucket brigade capacitor store. 3,671,771, Cl. 307-293.000.
Sarge, Carmen R.: *See—*
Sabatelli, Philip M.; Loder, Edwin R.; Brungs, Charles A.; and Sarge, Carmen R., 3,671,440.
Sargent, Jerald P., to Minnesota Mining and Manufacturing Company. Electrostatically-charged fluidized bed apparatus. 3,670,699, Cl. 118-629.000.
Sasaki, Nobuyuki; Oba, Shunzo; and Yano, Tadashi, to Matsushita Electric Industrial Co., Ltd. Sliding type variable resistor. 3,671,915, Cl. 338-183.000.
Saskai, Toshio: *See—*
Yasui, Koichi; Yamamoto, Kazuo; Itami, Kazuo; Fujisawa, Kiyoshi; and Saskai, Toshio, 3,671,279.
Sassano, John H., to Weather Control Shutters, Inc. Folding closure construction. 3,670,797, Cl. 160-118.000.
Sasse, Klaus; Scheinpflug, Hans; and Grews, Ferdinand. 1-Phenyl-4,4-di-substituted-thiosemicarbazide fungicidal and acaricidal agents. 3,671,639, Cl. 424-323.
Sassmanshausen, Knut Otto. Lamp. 3,671,732, Cl. 240-8.3.
Sato, Akira: *See—*
Nakamura, Hiroto; Sato, Akira; and Doi, Ken-Ichi, 3,671,794.
Sato, Ituzo: *See—*
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Sato, Katsuo: *See—*
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Sato, Masaki: *See—*
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Sato, Tadashi: *See—*
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Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, 3,671,937.
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Satomo, Kouji: *See—*
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Saucier, Randolph J., to Shell Oil Company. Method of gravel-packing production well borehole. 3,670,817, Cl. 166-252.000.
Saucy, Gabriel, to Hoffmann-La Roche Inc. Preparation of amino-ethyl isoxazolyl substituted tetrahydropyrans and intermediates therefor. 3,671,539, Cl. 260-307.00h.
Sauer, Earl S.: *See—*
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Sautter, Gerhard: *See—*
Meyer, Jurgen; and Sautter, Gerhard, 3,671,839.
Meyer, Jurgen; and Sautter, Gerhard, 3,671,840.
Savit, Carl H., to Western Geophysical Company of America. Extended area acoustic impulse generator. 3,670,839, Cl. 181-.50h.
Sawada, Eiji, to Denki Onkyo Company, Limited. Deflection yokes for cathode ray tubes. 3,671,894, Cl. 335-210.000.
Sawada, Hiroyuki; Miyawaki, Saburo; and Ishikawa, Hajime. Apparatus for continuously making a hose. 3,671,359, Cl. 156-436.000.
Sawada, Toshio, to Aisin Seiki Kabushiki Kaisha. Control means for buttonhole zigzag sewing machine. 3,670,676, Cl. 112-158.00b.
Sawazu, Toshihiko: *See—*
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Sawyer, Joseph A.: *See—*
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Saxton, Arthur L., to Esso Research and Engineering Company. Two stage fluid coking. 3,671,424, Cl. 208-127.000.
Scaramucci, Domer. Valve assembly with drop-type stem. 3,671,010, Cl. 251-151.000.
Scarlett, Robert M., to International Telephone and Telegraph Corporation. High frequency transistor structure having an impedance transforming network incorporated on the semiconductor chip. 3,671,793, Cl. 317-235.00r.
Scarnato, Thomas J.: *See—*
Tufts, Guy O.; Scarnato, Thomas J.; and Peacock, Peter J., 3,670,483.
Schachat, Norman: *See—*
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Schering AG: *See—*
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Schiefer, Paul J.; and McFarland, James D., Jr., 3,670,859.
Schiefer, Paul J.; and McFarland, James D., Jr., to Schiefer Manufacturing Company. Clutch and clutch cover. 3,670,859, Cl. 192-112.000.
Schilling, Werner; and Ott, Wolfgang, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Flashbulb with percussion ignition and pre-formed ignition tube. 3,671,166, Cl. 431-93.000.
Schimpf, Luther G.: *See—*
Henry, James L.; and Schimpf, Luther G., 3,671,676.
Schlecht, Helmut; and Aurnhammer, Robert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the continuous production of [31-chloropropionic acid. 3,671,584, Cl. 260-539.00r.
Schloemann Aktiengesellschaft: *See—*
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Schneider, Eckart: *See—*
Heitmann, Knut; and Schneider, Eckart, 3,671,750.
Schneider, Paul Adrian, to A/S Ardal og Sunndal Verk. Crushing machine for coarse crushing of brittle materials. 3,670,971, Cl. 241-69.000.
Schoenberg, Jules Ernest: *See—*
Schrage, Albert; and Schoenberg, Jules Ernest, 3,671,505.
Schoerner, Roger J., to Southwire Company. Method of fabricating aluminum alloy rod. 3,670,401, Cl. 29-527.7.
Schoffmann, Rudolf, to Vereinigt Osterreichesche Eisen-und Stahlwerke Aktiengesellschaft. Rolls and rollers particularly for continuous casting plants, bar deformation plants and for hot rolling mills operated at low rolling speeds. 3,670,381, Cl. 29-124.000.
Schofield, J. Allan; and Delano, Roger A., to Union Carbide Corporation. Azeotropic composition. 3,671,442, Cl. 252-171.000.
Schofield, J. Allan; and Delano, Roger A., to Union Carbide Corporation. Azeotropic composition. 3,671,443, Cl. 252-171.000.
Schofield, J. Allan; and Delano, Roger A., to Union Carbide Corporation. Azeotropic composition. 3,671,444, Cl. 252-171.000.
Schofield, J. Allan; and Delano, Roger A., to Union Carbide Corporation. Azeotropic composition. 3,671,445, Cl. 252-171.000.
Schofield, J. Allan; and Delano, Roger A., to Union Carbide Corporation. Azeotropic composition. 3,671,446, Cl. 252-171.000.
Scholl, Robert F., to Monsanto Company. Web marking device. 3,670,615, Cl. 83-367.000.
Schrage, Albert; and Schoenberg, Jules Ernest, to Dart Industries Inc. Suspension polymerization method for preparing elastomeric hydrocarbon interpolymers. 3,671,505, Cl. 260-80.780.
Schreiber, David D.: *See—*
Gramza, Eugene P.; and Schreiber, David D., 3,671,240.
Schroder, Eberhard: *See—*
Albrecht, Rudolf; Kessler, Hans-Joachim; and Schroder, Eberhard, 3,671,520.

Schubart, Rudiger; Roos, Ernst; and Abele, Manfred, to Farbenfabriken Bayer Aktiengesellschaft. Vulvanization retarders. 3,671,503, Cl. 260-79.50b.

Schueren, William B.: *See—*
Gebhard, Harold C.; and Schueren, William B., 3,670,454.

Schuette, Gunter G., to Motorola, Inc. Ignition system. 3,671,805, Cl. 315-209.000.

Schulte, Louis T., to TRW Inc. Current pulse generator. 3,670,578, Cl. 74-5.600.

Schultz, Arthur H. Thermodynamic power system and methods. 3,670,500, Cl. 60-57.00r.

Schultz, Forrest O. E., to Midland-Ross Corporation. Compressor governor. 3,670,756, Cl. 137-102.000.

Schultz, James F., to Aquatronics. Automatically energizable sonobuoy. 3,671,928, Cl. 340-2.000.

Schultz, Odetta B. Side mounted rear view automotive mirror assembly and mounting bracket therefor. 3,671,005, Cl. 248-480.000.

Schultz, William D.: *See—*
Bushman, Bliss M.; and Schultz, William D., 3,671,100.

Schulz, Johann G. D.: *See—*
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Schumacher, Stephen J.: *See—*
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Schurch, Eugen, to Von Roll AG. Transportation installation. 3,670,659, Cl. 104-101.000.

Schutz, Heinz Dieter: *See—*
Neumann, Wolfram; Muller, Gerhard; Ranz, Erwin; Von Rintelen, Harald; and Schutz, Heinz Dieter, 3,671,252.

Schwager, Irving; Leak, Robert J.; and Cole, Edward L., to Texaco Inc. Dehydrogenation of alcohols to ketones. 3,671,591, Cl. 260-596.000.

Schwartz, John L.: *See—*
Spanel, Abram N.; and Schwartz, John L., 3,670,672.

Schwartz, John L., assor. to said Spanel. Abram N.: *See—*
Spanel, Abram N.; and Schwartz, John L., 3,670,672.

Schwarz, Hans G., to United States of America, Navy, mesne. Noise suppression arrangement for communication receivers. 3,671,867, Cl. 325-410.000.

Schwellenbach, Donald D. Apparatus for making concrete blocks. 3,671,165, Cl. 425-445.000.

Sciacero, Rinaldo: *See—*
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SCM Corporation: *See—*
Bledsoe, James O., Jr., 3,671,551.
Gilchrist, Allan E., 3,671,464.
Norris, Max E., 3,671,459.

Scott, Daniel G., to Westinghouse Air Brake Company. Empty-load changeover apparatus. 3,671,086, Cl. 303-23.

Scott, William Bryson. *See—*
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Lynch, John F.; Scott, William Bryson; and Paoletti, Alfred J., 3,671,207.

Scott, William P.; and Rogers, Lynn C., to Continental Oil Company. Grease compositions containing polymers. 3,671,012, Cl. 252-33.400.

Scragg, Ernest, & Sons Limited: *See—*
Kneafsey, Adrian W., 3,670,490.

Seaberg, Lewis A. Composite valve stem. 3,670,688, Cl. 116-34.000.

Sealectro Corporation: *See—*
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Searcy, Ronald: *See—*
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Searle, G. D., & Co.: *See—*
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Seay, Philip B., to Inta-Roto, Inc. Web handling apparatus and spindle chuck therefor. 3,670,979, Cl. 242-64.

Sebek, Oldrich K.; and Meyer, Curtis E., to Upjohn Company, The. Tirandamycin and process for making same. 3,671,628, Cl. 424-120.000.

Sedor, Edward A.; and Slagel, Robert C., to Ashland Oil, Inc. Polymers formed from the reaction of a mixture of a polyepoxide and a polyester and an unsymmetrical disubstituted hydrazine. 3,671,473, Cl. 260-18.0pf.

Seebold, Walter Charles: *See—*
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Seegmiller, David W.: *See—*
King, Lowell A.; and Seegmiller, David W., 3,671,322.

Seemann, Fritz: *See—*
Troxler, Franz; and Seemann, Fritz, 3,671,587.

Segawa, Takashi. Inter housing multi-speed transmission hub provided with a coaster brake. 3,670,856, Cl. 192-6.00a.

Seid, Volker, to Cillichemie Ernst Vogelmann. Control arrangement for a swimming pool filter. 3,670,893, Cl. 210-138.000.

Seidel, Manfred: *See—*
Diery, Helmut; Kiefer, Bernhard; Rittner, Siegbert; and Seidel, Manfred, 3,671,308.

Seifert, Friedrich; and Bittscheidt, Josef, to Chemische Werke Huels, A.G. Conductive thermoplastic composition useful for high tension cables. 3,671,663, Cl. 174-120.0sc.

Seil, Lewis W., to Cory Corporation. Humidifier. 3,671,023, Cl. 261-26.000.

Seiler, Martin W. Apparatus for shipment and storage of magnetic memory discs and the like. 3,670,878, Cl. 206-62.00p.

Seino, Kuniki, to Minolta Camera Kabushiki Kaisha. Method and apparatus for masking images by polarization light regulator. 3,671,104, Cl. 350-157.000.

Seipp, William H., to Gulf & Western Industries, Inc. High accuracy solid state timer. 3,671,817, Cl. 317-141.00s.

Seitz, Martin A.: *See—*
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Sel-Rex Corporation: *See—*
Martini, Albert Michael, 3,671,408.

Semsel, Andrew Milo: *See—*
Rauhut, Michael McKay; and Semsel, Andrew Milo, 3,671,450.

Senft, Hervert; and Rinnergschwentner, Hans, to Daimler-Benz Aktiengeselischaft. Steering installation, especially for commercial-type vehicles. 3,670,592, Cl. 74-493.000.

Senoptics, Inc.: *See—*
Oldfield, Andrew H.; and Trott, Arthur F., 3,670,460.

Seragnoli, Ariosto, to G. D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli. Machine for forming and wrapping up individual articles such as candies. 3,670,475, Cl. 53-234.000.

Service Dynamics, Inc.: *See—*
Grazier, Robert L.; and Kudingo, Kenneth F., 3,670,512.

Seya, Atsumi: *See—*
Akuta, Tomohiko; Seya, Atsumi; and Hashirizaki, shinya, 3,670,833.

Shaheen, Eugene G.: *See—*
Larson, Leland B.; and Clement, Clyde H., 3,670,959.

Shalyt, German Mikhailovich; Sidorchuk, Svetlana Efimovna; and Pavlov, Gely Georgievich. Pulse reflection type fault location device utilizing a dark-trace tube display. 3,671,856, Cl. 324-52.000.

Shank, Wayne C., to Avco Corporation. Damped turbomachine rotor assembly. 3,671,140, Cl. 416-183.000.

Shapiro, Sidney; and Longacre, Andrew, Jr., to United States of America, Navy. Frequency conversion with Josephson junctions. 3,671,848, Cl. 321-69.0nl.

Shaub, Harold: *See—*
Metro, Stephen J.; and Shaub, Harold, 3,671,434.

Shaw, Clarence W., to McDermott, J. Ray, & Co., Inc. Propeller wash diversion apparatus for pipe barge. 3,670,510, Cl. 61-72.100.

Shaw, Donald George, 1/2 to Shaw, Trew & Smith Limited. Mobile load handling or lifting machines. 3,670,910, Cl. 214-141.000.

Shaw, Trew & Smith Limited: *See—*
Shaw, Donald George, 3,670,910.

Sheers, Edward Helmut; and Encke, Frederick Ludwig, to Arizona Chemical Company, mesne. Process for controlling foams in aqueous systems and composition therefor. 3,671,461, Cl. 252-358.000.

Shekhodanov, Mikhail Petrovich: *See—*
Lutchenkov, Anatoly Matveevich; Shekhodanov, Mikhail Petrovich; Siyanov, Sergei Alexandrovich; Korovin, Ivan Stepanovich; Kholstova, Nonna Alexandrovna; Kreptseva, Valentina Nikolaevna; and Leskovskaya, Nina Petrovna, 3,671,125.

Sheldon, Donald E., to United Aircraft Corporation. Combustion chamber support. 3,670,497, Cl. 60-39.320.

Sheldrake, Leonard J.: *See—*
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Shell Oil Company: *See—*
Kwantes, Arien; and Stouthamer, Bernhard, 3,671,559.
Saucier, Randolph J., 3,670,817.
Van Westrenen, William J., 3,671,474.

Shelley, Shelley W. Insulated reinforced building panel. 3,671,368, Cl. 161-38.000.

Shen, Tsung-Ying; and Dorn, Conrad P., Jr., to Merck & Co., Inc. Substituted biphenyl acetic acids and ester derivatives thereof. 3,671,580, Cl. 260-520.000.

Shepanski, Joseph F. Tool for removing fuel injectors. 3,670,389, Cl. 29-256.000.

Shepp, Allan: *See—*
Corben, Leo D.; Kammerer, William T.; and Shepp, Allan, 3,671,246.

Sherman, Albert H.; and Zech, John D., to Atlas Chemical Industries, Inc. Mixtures of fatty ethers of polyhydric alcohols and their anhydrides and process for producing said mixtures. 3,671,458, Cl. 252-351.000.

Sheth, Prabhakar Ranchhordas; and Wiley, James Henry, to American Cyanamid Company. Process for tabletting acetazolamide. 3,671,633, Cl. 424-273.000.

Shibano, Takashi, to Matsushita Electric Industrial Co., Ltd. Power supply for driving magnetron. 3,671,847, Cl. 321-32.000.

Shibata, Ryoji; and Shibata, Seiichi. Adhesive device. 3,670,434, Cl. 40-104.180.

Shibata, Seiichi: *See—*
Shibata, Ryoji; and Shibata, Seiichi, 3,670,434.

Shibuya, Koji; and Takano, Teruhi, to Nippon Electric Co., Ltd. Single pulse generating circuit. 3,671,761, Cl. 307-106.000.

Shiiki, Zenya: *See—*
Amagi, Yasuo; Ohya, Masaki; Shiiki, Zenya; and Yusa, Haruhiko, 3,671,610.

Shikata, Kazuo; Nakao, Suekiti; and Knomi, Katsutoshi, to Tokuyama Soda Kabushiki Kaisha. Process for polymerizing three-membered heterocyclic compounds. 3,671,466, Cl. 260-2.00a.

Shima, Seiya, to Hitachi, Ltd. Speed pattern generator for elevator control system. 3,670,851, Cl. 187-29.00r.

Shimamura, Isao: *See—*
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Shimetsu Chemical Company: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; and Tajima, Shigenobu, 3,671,508.

Shimizu, Akira, to Piolot Man-Nen-Hitsu Kabushiki Kaisha. Device for fixing articles in frame structures. 3,670,439, Cl. 40-156.000.

Shimizu, Sakae: *See—*
Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo, 3,671,235.

Shimomura, Seiichi: *See—*
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Shimosato, Kazuo: *See—*
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Shinetsu Chemical Company: *See—*
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Shinkarenko, Boris Pavlovich: *See—*
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Shiojima, Kenji: *See—*
Usui, Yoshito; Shiojima, Kenji; and Hatakeyama, Toshikatsu, 3,671,891.

Shobert, Erle I., II: *See—*
Krellner, Walter G.; and Shobert, Erle I., II, 3,671,092.

Shoemaker, Arthur H.; and Sussman, Milton H., to American Optical Corporation. Zoom optical system for a microscope. 3,671,099, Cl. 350-43.000.

Short, Glyn David: *See—*
Andrews, Timothy Douglas; Short, Glyn David; and Thomas, Ieuan, 3,671,250.

Shove, Gordon William: *See—*
Gackstetter, Henry Clinton; Anderson, Harold Francis; Shove, Gordon William; and Morin, Louis George, 3,671,314.

Showa Kagaku Kogyo Kabushiki Kaisha: *See—*
Suzuki, Kazuaki, 3,671,524.

Shute, Donald W., to Spacetac Incorporated. Waveform restorer circuit. 3,671,781, Cl. 307-252.00w.

Siddall, John B.; and Calame, Jean Pierre, to Zoecon Corporation. Novel esters and derivatives. 3,671,558, Cl. 260-410.90r.

Sidorchuk, Svetlana Efimovna: *See—*
Shalyt, German Mikhailovich; Sidorchuk, Svetlana Efimovna; and Pavlov, Gely Georgievich, 3,671,856.

Siegelin, Werner: *See—*
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Siegener Maschinenbau G.m.b.H.: *See—*
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Siemens Aktiengesellschaft: *See—*
Behn, Reinhard; Gottlob, Heinrich; Haid, Hans; Hoyler, Gerhard; and Kessler, Hartmut, 3,670,378.
Grassmann, Hans-Christian; and Walther, Emil, 3,671,704.
Haas, Guenther; and Reinhardt, Dieter, 3,671,873.
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Lutz, Karl-Anton, 3,671,674.
Meyer, Jurgen; and Sautter, Gerhard, 3,671,839.
Meyer, Jurgen; and Sautter, Gerhard, 3,671,840.
Muller, Erwin; and Bettini, Dino, 3,671,791.

Sih, Charles J., to Wisconsin Alumni Research Foundation. Method for preparing L-dopa. 3,671,397, Cl. 195-29.000.

Simjian, Luther G. Massaging device driven by exercise apparatus. 3,670,723, Cl. 128-64.000.

Simmons, John Ernest: *See—*
Rand, Walter Leslie; and Simmons, John Ernest, 3,671,158.

Simms, Harold J., Jr., to General Motors Corporation. Apparatus for generating an angularly displaceable magnetic field. 3,671,952, Cl. 340-177.000.

Simon, James Louis: *See—*
Knollman, Dieter John Henry; and Simon, James Louis, 3,671,942.

Simplex Wire and Cable Company: *See—*
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Simpson, George R.: *See—*
Mason, Lawrence J.; Simpson, George R.; Paradysz, Louis F.; and Chen, Philip L., 3,670,633.

Simpson Industries, Inc.: *See—*
Troyer, William J., 3,670,593.

Simpson, John I.: *See—*
Hogan, Elmer R.; and Simpson, John I., 3,670,363.

Sims, Marion W., to General Electric Company. Method of maintaining a laminated article under compression during a part of its manufacture. 3,670,408, Cl. 29-602.

Sinclair-Koppers Company: *See—*
Mills, Frank J.; Sadowski, John T.; Squires, Harwood H.; and Uebelhart, James J., 3,671,026.

Singer, Alfred Richard Eric, to National Research Development Corporation. Process and apparatus for fabricating a hot worked metal layer from atomized metal particles. 3,670,400, Cl. 29-527.500.

Singer Company, The, mesne: *See—*
Barnes, Lell E.; and Morris, David, 3,671,810.
Barnes, Robert L.; Block, William M.; and Grafstein, Danel, 3,671,489.

Singer, Ernst. Fluid sampling apparatus. 3,670,577, Cl. 73-423.

Sink, James A., Jr.; and Watson, Richard J., to Deering Milliken Research Corporation. Safety control. 3,671,170, Cl. 431-88.000.

Siyanov, Sergei Alexandrovich: *See—*
Lutchenkov, Anatoly Matveevich; Shekhodanov, Mikhail Petrovich; Siyanov, Sergei Alexandrovich; Korovin, Ivan Stepanovich; Kholstova, Nonna Alexandrovna; Kreptseva, Valentina Nikolaevna; and Leskovskaya, Nina Petrovna, 3,671,125.

Skalsey, Lily G., to Lear Siegler, Inc. Pot broaching machine. 3,670,625, Cl. 90-86.000.

Skonare, Per: *See—*
Stahl, Nils Evert Johan; and Skonare, Per, 3,671,097.

Skrentner, Frank C., to La Salle Machine Tool, Inc. Method for machining spaced surfaces. 3,670,607, Cl. 82-1.00c.

Slagel, Robert C.: *See—*
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Slagteriernes Forskningsinstitut: *See—*
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Slater Electric Inc.: *See—*
Drapkin, William, 3,671,925.

Slawinski, Frank E., to Atlas Chemical Industries, Inc. Dynamite composition containing expanded thermoplastic beads. 3,671,342, Cl. 149-21.000.

Slaybaugh, Loren E., to Republic Industries Inc. Sliding door operator. 3,670,455, Cl. 49-360.000.

Slayden, James D., to Avco Corporation. Connector. 3,671,063, Cl. 287-189.36c.

Slutsky, Arthur Samuel. Method and apparatus of digitizing analog records. 3,671,716, Cl. 235-61.60a.

Smars, Erik Algot, to AGA Aktiebolag. Process and apparatus for effecting high gas flow in discharge tube of gas laser. 3,671,883, Cl. 331-94.500.

Smith, Arthur E., to Union Carbide Corporation. Electrode contact device. 3,671,656, Cl. 13-14.000.

Smith, David F. Plaster of Paris bandages to make casts of improved strength, water-resistance and physiological properties. 3,671,280, Cl. 106-116.000.

Smith, Ernest L., to Phillips Petroleum Company. Container and lid. 3,670,951, Cl. 229-43.000.

Smith, Frank: *See—*
King, John Howliston; and Smith, Frank, 3,671,415.

Smith, Harry W.: *See—*
Thompson, Harold W.; Smith, Harry W.; and McCann, Paul A., Jr., 3,671,943.

Smith, Herchel: *See—*
Tokolics, Joseph; Hughes, Gordon A.; and Smith, Herchel, 3,671,519.

Smith International Inc.: *See—*
Winter, Henry A., Jr.; Williams, Arthur M., Jr.; and Foss, Richard L., 3,670,831.

Smith, Joseph E., to Wolverine-Pentronix, Inc. Die and punch assembly for compacting powder material. 3,671,157, Cl. 425-78.000.

Smith Kline & French Laboratories, Inc.: *See—*
Pfeiffer, Francis R.; and Weisbach, Jerry A., 3,671,557.
Pfeiffer, Francis R.; and Weisbach, Jerry A., 3,671,563.

Smith, Van Z., to All Products Company. Sectional tower structure. 3,670,471, Cl. 52-638.000.

Smith, William D.: *See—*
Basham, Edward R.; and Smith, William D., 3,670,566.

Smith, William Novis, Jr., to Foote Mineral Company. Isomerization of allenes into their corresponding terminal acetylenic isomers. 3,671,605, Cl. 260-678.000.

Smith-Berger Manufacturing Corporation: *See—*
Hogan, Elmer R.; and Simpson, John I., 3,670,363.

Smolka, Thomas G., to Wiener Metallwarenfabrik Smolka and Company. Ski binding. 3,671,053, Cl. 280-11.35t.

Smythe, John W.; and Karp, Philip I., to Federal-Mogul Corporation. Method of making superalloys. 3,671,230, Cl. 75-213.000.

Snijders, Wilfred Andre Maria: *See—*
Zegers, Eduard; and Snijders, Wilfred Andre Maria, 3,671,864.

Snyder, Paul W., Jr.: *See—*
Ireland, Henry R.; and Snyder, Paul W., Jr., 3,671,419.

Snyder, Thomas P.: *See—*
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Sobrevin Soc. de Brevets Industriels, Firma: *See—*
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Societa' Italiana Resine S.p.A.: *See—*
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Societe Alsacienne de Constructions Atomiques, de Telecommunications et d'Electronique calcatel: *See—*
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Societe Anonyme dite: L'Oreal: *See—*
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Societe de Recherches Industrielles S.O.R.I.: *See—*
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Societe d'Etudes et d'Exploitation de Procedes pour l'Industrie Alimentaire Sepial: *See—*
Bonteil, Robert C., 3,670,520.

Societe Les Piles Wonder: *See—*
Angibaud, Rene M., 3,671,734.

Societe Rhodiaceta: *See—*
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Sola Basic Industries, Inc.: *See—*
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Sollman, George H.; and Dixon, Samuel J., to Honeywell Inc. Four phase encoder system for three frequency modulation. 3,671,960, Cl. 340-347.0dd.
Solvay & Cie: *See—*
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Sori, Naoyuki: *See—*
Abe, Isamu; Yashiro, Hideo; Sori, Naoyuki; Hatano, Sotaro; Katsumoto, Tomiyasu; and Suzuki, Tadao, 3,670,395.
Southwire Company: *See—*
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Spacetac Incorporated: *See—*
Shute, Donald W., 3,671,781.
Spanel, Abram N.; and Schwartz, John L., said Schwartz, John L., assor. to said Spanel, Abram N. Tufting machines for manufacture of tufted fabrics, tufted carpets, rugs, drapes, heavy fabrics, and the like. 3,670,672, Cl. 112-79.
Spangler, Myrtle Joanne, to Dan River Inc. Crease-proofing compositions containing glyoxal modified uron resins and processes for making same. 3,671,307, Cl. 117-139.400.
Sperry Rand Corporation: *See—*
Barnes, Billy W., 3,671,933.
Clift, Charles E., 3,671,899.
Rakes, Rodney G., 3,671,833.
Rowland-Hill, Edward William, 3,670,739.
Spider Staging, Inc.: *See—*
Fisher, Sidney L., 3,671,712.
Spietschka, Ernst: *See—*
Papenfuss, Theodor; and Spietschka, Ernst, 3,671,553.
Spilsbury, Ashton James; and Thorkelson, Oswald. Adjustable centre loaded antenna arrangement. 3,671,972, Cl. 343-750.000.
Squires, Harwood H.: *See—*
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Stackpole Carbon Company: *See—*
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Stafsudd, Oscar M.: *See—*
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Stahl, Nils Evert Johan; and Skonare, Per. Arrangement in optical character reading. 3,671,097, Cl. 350-7.000.
Stahr, Henry M., to Morris, Philip, Incorporated. Method for making metal oxide membranes. 3,671,410, Cl. 204-56.000.
Stallings, Leon; Devine, Martin J.; Maerker, Gerhard; and Eisner, Abner, to United States of America, Navy. Lubricating grease compositions. 3,671,431, Cl. 252-33.600.
Stamm, Alex F., to North American Rockwell Corporation, mesne. Friction welding apparatus. 3,671,049, Cl. 279-4.000.
Stampfli, Harald, to Lucifer S.A. Fluid-controlling valve. 3,671,009, Cl. 251-129.000.
Standard Oil Company (Indiana): *See—*
Peters, Edwin F.; and Juveland, Omar O., 3,671,432.
Standard Optical Mfg. Company: *See—*
Okner, Luke, 3,671,111.
Standifer, Richard L.: *See—*
Heady, Orville E.; Towell, John F.; and Standifer, Richard L., 3,671,199.
Stanton, Arthur J.; Kolb, Edwin R.; and Roberts, Webster C., to Harris-Intertype Corporation. Phototypesetting apparatus. 3,670,632, Cl. 95-4.50r.
Stark, Daniel J., to Eastman Kodak Company. Cartridge mounting structure for a cartridge loading motion picture projector or the like. 3,670,991, Cl. 242-197.000.
Stark, Herbert: *See—*
Alexander, Newton C.; Stark, Herbert; and Thornton, Richard C., 3,670,585.
Stauffer, Norman L., to Honeywell Inc. Magnetostrictive recording assembly. 3,671,681, Cl. 179-100.2ch.
Stauner, Thomas: *See—*
Froehlich, Alfred; Piller, Bernhard; and Stauner, Thomas, 3,671,253.
Stebbins, Herve A.; and Stebbins, John A. Multiple sight for archer's bow. 3,670,422, Cl. 33-265.000.
Stebbins, John A.: *See—*
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Stecker, Merrick C. Paint scraper. 3,670,414, Cl. 30-338.000.
Steinberg, Harvey M.: *See—*
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Steinbrunn, Gustav: *See—*
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Steiner, William R.: *See—*
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Steingiser, Samuel: *See—*
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Stelling, Mogens. Transportation system. 3,670,658, Cl. 104-22.
Stephens, John A.: *See—*
Coombs, Ivan G., 3,671,710.
Sternbach, Henryk: *See—*
Archer, Giles Allan; and Sternbach, Henryk, 3,671,517.
Stetson, Earl W., to General Electric Company. Sparkgap chamber with arc stretching teeth embodying optimum heat sink means. 3,671,797, Cl. 313-325.000.
Stetson, Earl W., to General Electric Company. Self-supporting load bearing voltage grading resistors for a lightning arrester. 3,671,800, Cl. 315-36.000.
Stettner, Dennis; and Hollison, Ronald B. Ski equipment lock assembly. 3,670,535, Cl. 70-58.000.
Stevens, Curtis Edgar, to Bertea Corporation. Anti-skid system. 3,671,082, Cl. 303-21 00p.
Stevenson, James F., to Emhart Corporation. Glass furnace with triple batch charging and method. 3,670,908, Cl. 214-24.000.
Stevick, Lawrence E., to Chevron Research Company. Dialkyl dihydrothienyl phosphates. 3,671,547, Cl. 260-329.00p.
Steward, William A., to Steward, Wm. A. Magnetic in and out board. 3,670,435, Cl. 40-106.450.
Steward, Wm. A.: *See—*
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Stewart, William R., Jr.: *See—*
Rahenkamp, Robert A.; and Stewart, William R., Jr., 3,671,683.
Stewart-Warner corporation: *See—*
Rieth, Lawrence E., 3,671,923.
Stewert, Robert M., to General Motors Corporation. Boiler control system. 3,670,704, Cl. 122-448.00s.
Sto, Masamichi: *See—*
Matsumoto, Seiji; Tamai, Yasuo; and Sto, Masamichi, 3,671,290.
Stolpen, Beulah Harris. Language teaching apparatus and method. 3,670,427, Cl. 35-35.00j.
Stone, Glenn Duane, to Du Pont de Nemours, E. I., and Comany. Imagewise hardening direct writing photodeveloped silver halide emulsions. 3,671,245, Cl. 96-64.000.
Storz, Frederick G., to GTE Automatic Electric Laboratories Incorporated. Piezoelectric signaling device. 3,671,958, Cl. 340-392.000.
Stout, Beauford F., to Worth Well Surveys, Inc. Measuring borehole temperatures employing diode junction means. 3,670,567, Cl. 73-154.000.
Stouthamer, Bernhard: *See—*
Kwantes, Arien; and Stouthamer, Bernhard, 3,671,559.
Streckert, Ernest H. Automatic veneer measuring and clipping control system. 3,670,614, Cl. 83-208.000.
Streicher, Heinz: *See—*
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Striegler, John H., to Atlantic Richfield Company. Slim hole drilling method. 3,670,832, Cl. 175-57.000.
Strobl, Frederick P., Jr.: *See—*
Ettlinger, Ralph, Jr.; and Strobl, Frederick P., Jr., 3,670,911.
Stroebel, Maurice G.; Stroebel, Terryl T.; and Stroebel, Merle J. Liquid fertilizer applying apparatus. 3,670,963, Cl. 239-77.000.
Stroebel, Merle J.: *See—*
Stroebel, Maurice G.; Stroebel, Terryl T.; and Stroebel, Merle J., 3,670,963.
Stroebel, Terryl T.: *See—*
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Stromberg, Henry M.: *See—*
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Strum, Bobbie W.: *See—*
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Stuetz, Dagobert E., to Celanese Corporation. Thermal stabilization of addition polymers. 3,671,488, Cl. 260-45.70r.
Stull, James T.: *See—*
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Low, George M., Acting Administrator of the; National Aeronautics and Space Administration with; Stump, Eugene C., Jr.; and Rochow, Stephen Eugene, 3,671,497.
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Sugano, Shigeaki; and Uesugi, Kyozo, to Minolta Camera Co., Ltd. Focusing mechanism for catadioptric objective. 3,671,109, Cl. 350-299.000.
Sugiyama, Hironari: *See—*
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Sukow, Daniel L.: *See—*
Fuchs, Richard C.; Sukow, Daniel L.; and Wilke, Dennis P., 3,671,785.
Sullivan, Gene F., to Brown, Howard W. Portable hoisting unit. 3,671,015, Cl. 254-142.000.
Sullivan, Harold G., to United States of America, Air Force. Automatic channel equalization apparatus with data equalization mode adaptor. 3,671,672, Cl. 178-69.00a.
Sulzer Brothers, Ltd.: *See—*
Brunner, Alfred, 3,670,874.
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Sumino, Yasuhiro: *See—*
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Sumitomo Chemical Company, Ltd.: *See—*
Itaya, Nobushige; Mizutani, Toshio; Kitamura, Shigeyoshi; Okuno, Yositosi; and Fujimoto, Keimei, 3,671,548.
Koga, Koichi; Hatori, Minoru; and Akamatsu, Takashi, 3,671,543.
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Oshima, Teruo; Wada, Takeshi; Nagase, Tsuneyuki; Masuko, Fujio; Hirooka, Masaaki; and Taniguchi, Isoji, 3,671,506.

Sumitomo Electric Industries Ltd.: *See—*
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Sumitomo Light Metal Industries, Ltd.,: *See—*
Terai, Shiro; Suzuki, Toshio; Hasegawa, Yoshihumi; Horiguchi, Shojiro; Nakamura, Michiei; Kimata, Shizuo; and Suzuki, Tadanobu, 3,671,476.

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Sun Research and Development Co.: *See—*
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Sussman, Milton H.: *See—*
Shoemaker, Arthur H.; and Sussman, Milton H., 3,671,099.

Suzuki, Henry K., to Velsicol Chemical Corporation. Process for the production of 1,2,4,5,6,7,8,8- octachloro-3a,4,7,7a-tetranydro-4,7-methanoindane. 3,671,595, Cl. 260-648.00c.

Suzuki, Kazuaki, to Showa Kagaku Kogyo Kabushiki Kaisha. Triazinyl-coumarins. 3,671,524, Cl. 260-249.800.

Suzuki, Masaru; and Murakami, Yukinobu, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Multiple switch construction. 3,671,691, Cl. 200-61.540.

Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denik Seisakusho. Steering structure capable of simultaneously completing a horn circuit in a motor-car. 3,671,758, Cl. 307-10.00r.

Suzuki, Shohachi: *See—*
Hara, Ei; and Suzuki, Shohachi, 3,671,164.

Suzuki, Syoichi, to Nippon Gakki Seizo Kabushiki Kaisha. Plural tone selector for an electronic musical instrument. 3,671,659, Cl. 84-1.170.

Suzuki, Tadanobu: *See—*
Terai, Shiro; Suzuki, Toshio; Hasegawa, Yoshihumi; Horiguchi, Shojiro; Nakamura, Michiei; Kimata, Shizuo; and Suzuki, Tadanobu, 3,671,476.

Suzuki, Tadao: *See—*
Abe, Isamu; Yashiro, Hideo; Sori, Naoyuki; Hatano, Sotaro; Katsumoto, Tomiyasu; and Suzuki, Tadao, 3,670,395.

Suzuki, Takashi: *See—*
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Suzuki, Taro: *See—*
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Suzuki, Toshio: *See—*
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Suzuki, Tsutomu, to Pioneer Electronic Corporation. Automatic cartridge playing system. 3,671,682, Cl. 179-100.20z.

Swanson, Gunnar E., to Nielsen Hardware Corporation, The. Catch with anti-release latch. 3,670,371, Cl. 24-68.00t.

Swanson, John G., to Westinghouse Electric Corporation. Metal-insulator structures and method for forming. 3,671,819, Cl. 317-234.000.

Swanson, Robert E. Aerosol operated horn. 3,670,690, Cl. 116-112.000.

Swearingen Aviation Corporation, mesne: *See—*
Swearingen, Edward J., 3,670,995.

Swearingen, Edward J., to Swearingen Aviation Corporation, mesne. Longitudinal stability control device for fixed wing aircraft. 3,670,995, Cl. 244-80.000.

Swearingen, Judson S. Removal of dispersed gas from lubricating fluids. 3,670,850, Cl. 184-6.230.

Sweger, Theodore J., to Illinois Railway Equipment Company. Device for automatically latching a container to a railway car or the like and for automatically unlatching it therefrom. 3,670,663, Cl. 105-366.00c.

Swisher, Eugene Henry: *See—*
Briggs, Albert Theodore; and Swisher, Eugene Henry, 3,670,551.

Swiss Aluminum Ltd.: *See—*
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Sylvania Electric Products, Inc.: *See—*
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Kam, George H., 3,671,775.
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Zelenz, Martin L., 3,670,379.

Synergistics, Inc.: *See—*
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Szegvari, Andrew. Method and apparatus for comminuting and reacting solids. 3,670,970, Cl. 241-27.000.

Szente, Andre: *See—*
Hellerbach, Joseph; Szente, Andre; and Walser, Armin, 3,671,518.

Szente, Pedro A.; and Joly, Robert, to Hewlett-Packard Company. Wide band stop band filter including a ferrite region biased by a graded magnetic field. 3,671,888, Cl. 333-73.00r.

Szumila, Anthony D.; Zimnoch, Joseph J.; Bechtel, John D.; and Steinberg, Harvey M., to United States of America, Navy. Automatic net participant synchronizer. 3,671,865, Cl. 325-58.000.

Tabayanagi, Seiichi: *See—*
Kobayashi, Tetsuji; and Tabayanagi, Seiichi, 3,670,719.

Taber, Robert C., to Eastman Kodak Company. Speed increasing combination of stabilizers for radiographic elements. 3,671,258, Cl. 96-107.000.

Tajima, Shigenobu: *See—*
Koyanagi, Shunichi; Kitamura, Hajime; and Tajima, Shigenobu, 3,671,508.

Tajiri, Hisao; Sato, Ituzo; Takemura, Yasuo; and Tsuji, Shigeo, to Tokyo Shibaura Electric Co., Ltd. Color television image pick-up devices. 3,671,664, Cl. 178-5.4.

Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, to Iwatsu Electric Company Ltd. Discontinuity processing apparatus for automatic curve tracing system. 3,671,936, Cl. 340-146.3ae.

Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, to Iwatsu Electric Company, Ltd. Automatic pattern tracing systems. 3,671,937, Cl. 340-146.3ae.

Takahashi, Tadashi; Miyazaki, Masatoshi; Ogawa, Yasuhiko; Sato, Tadashi; and Kakuta, Kazuhiko, to Iwatsu Electric Company, Ltd. Apparatus for judging and processing branches and or crossings for use in automatic curve tracing system. 3,671,941, Cl. 340-172.500.

Takamune, Hirotoki; and Mochizuki, Yoshifumi, to Citizen Watch Co., Ltd. Balance wheel assembly. 3,670,492, Cl. 58-28.00a.

Takano, Teruhi: *See—*
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Takao, Hiroyoshi: *See—*
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Takashi, Masanor: *See—*
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Takeda Chemical Industries, Ltd.: *See—*
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Takemura, Yasuo: *See—*
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Takenaka, Sadao; Kishida, Soichiro; and Yamazaki, Yoichi, to Nippon Cloth Industry Co., Ltd. Cigarette filter materials. 3,670,740, Cl. 131-261.00r.

Takeno, Syozo: *See—*
Murakami, Yoshio; Higashinakagawa, Iwao; Yasuda, Nobuaki; and Takeno, Syozo, 3,671,312.

Takeuchi, Sugio: *See—*
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Takikawa, Toshio; Satomo, Kouji; and Kodama, Takashi, to Osaka Soda Co., Ltd. Method of making resin-impregnated sheet laminated to a substrate. 3,671,354, Cl. 156-306.000.

Takizawa, Haruki: *See—*
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Tamagawa Kikai Kinzoku Kabushiki Kaisha: *See—*
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Tamai, Yasuo: *See—*
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Tamplen, Jack W. Locking device and method and apparatus for emplacing same. 3,670,821, Cl. 166-315.000.

Tanaka, Atsuyuki: *See—*
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Tapscott, Jesse J.; and Andersen, Harold T., to Rietz Manufacturing Co. Apparatus for material fluffins. 3,671,019, Cl. 259-8.

Tarnopol, Milton S.; and Snyder, Thomas P., to PPG Industries, Inc. Applying electroconductive heating circuits to glass. 3,671,311, Cl. 117-211.000.

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Tateno, Hideo; and Nemoto, Kuniharu, to Nippon Electric Company, Limited. Method of fabricating semiconductor devices having alloyed junctions. 3,671,339, Cl. 148-179.000.
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TDK Electronics Company, Limited: *See—*
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Teichmann, Charles F.; and Brent, Albert, to Texaco Development Corporation. Garbage disposal process. 3,671,209, Cl. 48-209.000.
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Terashima, Toru, to Nippon Petroleum Refining Company. Method and multi-branched network system for uniformly distributing the flow of mixed phase fluids. 3,670,759, Cl. 137-171.000.
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Torsch, Charles Edward, to Sylvania Electric Products, Inc. Deflection system for triad-beam cathode ray tube. 3,671,896, Cl. 335-213.

Torsch, Charles Edward, to GTE Sylvania Incorporated. Asymmetrical-wound toroid yoke cathode ray tube deflection system. 3,671,897, Cl. 335-213.000.

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Tribken, Everett R.; and Miller, Frederic L., to United States of America, Navy. Pick-off. 3,671,904, Cl. 336-132.000.

Triggiani, Leonard V.; and Sanchez, Moises G., to Grace, W. R., & Co. Process for preparing multi-component nuclear fuels. 3,671,453, Cl. 252-301.10s.

Trimble, David Carlaw, to Bell telephone Laboratories, Incorporated. Per-cycle basis frequency signal receiver. 3,671,939, Cl. 340-171.000.

Triple 'A' Accessories: *See—*
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Troyer, William J., to Simpson Industries, Inc. Series type vibration damper. 3,670,593, Cl. 74-574.000.

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Uchida, Atsuyoshi; and Miyata, Yoshihiko, to Hitachi, Ltd. Method of manufacturing color picture tube. 3,670,376, Cl. 29-25.170.

Uchida, Hiromu; Umezono, Akimi; Saito, Takao; and Enari, Tsutomu, to Fuji Iron & Steel Co., Ltd. Metal materials suitable for organic coating. 3,671,205, Cl. 29-195.000.

Uchida, Kozo; and Tsuji, Toshiyuki, to Iwasaki Tsushinki Kaisha. Signal switching circuit operable in response to a voice signal. 3,671,673, Cl. 179-1.0cv.

Uchida, Naoya; Ohmachi, Yoshiro; Niizeki, Nobukazu; Miyazawa, Shintaro; and Iwasaki, Hiroshi, to Nippon Telegraph and Telephone Public Corporation. Di-lead molybdate ultrasonic light deflector. 3,671,103, Cl. 350-149.000.

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Sebek, Oldrich K.; and Meyer, Curtis E., 3,671,628.
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Usui, Yoshito; Shiojima, Kenji; and Hatakeyama, Toshikatsu, to Matsushita Electric Works, Ltd. Small type electro-magnetic contactor. 3,671,891, Cl. 335-126.000.
Utsunomiya, Jitsuo. Method of making artificial hair pieces. 3,670,741, Cl. 132-5.000.
Valantin, Alfred, to Charbonnages de France. Device for driving a shaft in rotation. 3,670,627, Cl. 91-167.
Vald. Henriksen A/S: *See—*
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Valspar Corporation, The: *See—*
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Van Beusekom, Philip C., to Minnesota Mining and Manufacturing Company. Pre-sensitized color proofing sheet. 3,671,236, Cl. 96-15.000.
Van Buskirk, Edward C., to Uniroyal, Inc. Leather-like three layer laminate. 3,671,375, Cl. 161-159.000.
Van Den Plassche, Rudy Johan, to U.S. Philips Corporation. Push-pull amplifier. 3,671,877, Cl. 330-30.00d.
Van Der Ven, Theodorus Johannes: *See—*
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Van Der Wijden, Franciscus Theodorus Maria, to Werf Conrad en Stork Hijsch N.V. and Nederlandsche Maatschappij voor Werken Buitengaats. Drilling apparatus. 3,670,830, Cl. 175-52.000.
Van Dyke, John William, Jr.; and Van Laecke, Margaret Jo, to Miles Laboratories, Inc. Certain substituted 1,3-bisdilower- alkylaminoethoxy-indans. 3,671,530, Cl. 260-295.00f.
Van Hoose, William E. Torque limiting wrench. 3,670,602, Cl. 81-52.400.
Van Horn, Russell F. Segmental friction member for brake or clutch. 3,670,858, Cl. 192-107.00r.
Van Laecke, Margaret Jo: *See—*
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Van Wassenhove, Sarfien V. Rear view mirror attachment. 3,671,110, Cl. 350-307.000.
Van Westrenen, William J., to Shell Oil Company. Water-thinnable condensation products and their use as paint binders. 3,671,474, Cl. 260-20.000.
Vanderberg, Lawrence J.: *See—*
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Suzuki, Henry K., 3,671,595.
Venuti, Richard Joseph; Golner, Jerold Julius; and D'Amato, Anthony Salvatore. Egg carton. 3,670,952, Cl. 229-44.00r.
Verderevsky, Vadim Anatolievich: *See—*
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Villanueva, Juan T.; and Villanueva, Jesus T. Automatic stripping machine for abaca and allied fiber bearing plants. 3,670,366, Cl. 19-12.000.
Vischiani, Giuseppe, to Sobrevin Soc. de Brevets Industriels, Firma. Delivery device for threads on weaving machines, knitting machines, or the like. 3,670,976, Cl. 242-47.120.
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Vogel, Leo G., to Campbell Soup Company. Apparatus for coating food articles. 3,670,694, Cl. 118-24.000.

Vogel, Ralph A.; and Moss, Harold S., to Essex International, Inc. Method and apparatus for siphoning molter metal to a continuous casting machine. 3,670,799, Cl. 164-63.000.

Voith Getriebe KG: *See—*
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Wada, Tadashi; and Itoh, Kunio, to Shinetsu Chemical Company. Heat-curable elastomeric silicone compositions. 3,671,480, Cl. 260-29.1sb.

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Wagner, John: *See—*
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Wahlstrom, P. Borje; and Adamson, J. Eric, to Johnson, A. & Co., Inc. Apparatus for transferring a web from the forming section to the press section in a papermaking machine. 3,671,389, Cl. 162-306.000.

Wait, John D., Jr., to Caterpillar Tractor Co. Heating and air-conditioning system for construction equipment. 3,670,808, Cl. 165-42.000.

Walander, Karl Ove Torgny: *See—*
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Walker, Robert C.: *See—*
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Walker, Robert H. Method and apparatus for manufacturing tumbling media. 3,670,467, Cl. 51-298.000.

Wallace, Bruce Alden, to Pullman Incorporated. Cracking furnace having thin, straight single pass reaction tubes. 3,671,198, Cl. 23-277.000.

Walle, Leonard A., to Du Pont de Nemours, E. I., and Company. Thermosetting acrylic enamel containing minor amounts of cellulose acetate butyrate. 3,671,293, Cl. 117-74.000.

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Waltermire, Clayton L., to International Telephone and Telegraph Corporation. Fast warm-up indirectly heated cathode structure. 3,671,792, Cl. 313-337.000.

Walters, William D. Buoyancy adjustment back pack. 3,670,509, Cl. 61-69.000.

Walther, Emil: *See—*
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Ward, Donald H.: *See—*
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Warren Petroleum Corporation: *See—*
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Warwick Electronics Inc.: *See—*
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Wasem, Hans: *See—*
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Wassem, Howard M.: *See—*
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Watanabe, Kazutaka, to Yokogawa Electric Works, Ltd. Pulse transmitting and receiving systems. 3,671,671, Cl. 178-68.000.

Watanabe, Shinro: *See—*
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Watson, Edward J.; and LaBar, Dale H., to American Home Products Corporation. Process for the preparation of 2-substituted-1,3-cyclopentanediones. 3,671,589, Cl. 260-586.00r.

Watson, Marshall T.: *See—*
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Watton, John F.: *See—*
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Weaner, Edward. Eyelash applicator. 3,670,742, Cl. 132-88.700.

Weather Control Shutters, Inc.: *See—*
Sassano, John H., 3,670,797.

Weaver, Leonard Wheelock, to Bird & Son, Inc. Plastic gutter expansion joint construction. 3,670,505, Cl. 61-14.000.

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Weber, Edwin J., to Black and Decker Manufacturing Company, The. Coupling for tool element. 3,670,413, Cl. 30-276.000.

Weber, Hans B.; and Brown, Joseph, to Midland-Ross Corporation. Dampened railway car truck. 3,670,660, Cl. 105-171.000.

Weber, Heinz, to Telesco Brophey Limited. Handle for umbrella. 3,670,748, Cl. 135-20.000.

Weber, Roger L., to Texas Instruments, Incorporated. Method of adjusting inductive devices. 3,670,406, Cl. 29-593.000.

Weeks, Francis G. Ski edge sharpener. 3,670,601, Cl. 76-83.000.

Wegmar, Per Augustin: *See—*
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Wehmeyer, Thomas R. Fish hook locator-extractor. 3,670,448, Cl. 43-53.500.

Weiers, Merle E. Die casting plungers. 3,670,805, Cl. 164-312.000.

Weiler, Ernest A., to Xerox Corporation. Two step orbital pad development. 3,670,701, Cl. 118-637.000.

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Weinstock, Marcel, to Hoffmann-La Roche Inc. Process for preparing vitamin A esters. 3,671,575, Cl. 260-491.000.

Weir, Samuel R., to Engelhard Minerals & Chemicals Corporation. Method for concentrating slimed minerals. 3,670,883, Cl. 209-5.000.

Weisbach, Jerry A.: *See—*
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Weischedel, Herbert Rudolf; and Westerman, George Raymond, to Bell Telephone Laboratories, Incorporated. Dual-output regulated switching power supply. 3,671,853, Cl. 323-17.000.

Weissman, Joel, to Ketcham & McDougall, Inc. Cube calendar. 3,670,436, Cl. 40-107.000.

Welch, Vergil B., Jr., to Grace, W. R., & Co. Magnetically securable printing plate. 3,670,646, Cl. 101-382.0mv.

Wellhausen, Heinz, to Blaupunkt-Werke GmbH. Tuning system for communication receivers storing predetermined tuning positions within the receiver frequency band. 3,671,870, Cl. 325-470.000.

Wells, Bernard L.: *See—*
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Welsh, Clarke T.; and Brumett, Billy M. Self-cleaning air filter. 3,670,478, Cl. 55-242.

Welton, Derek Edwin, to Waso Limited. Combined abrading, scraping and poking implement. 3,670,459, Cl. 51-181.00r.

Wenzel, Werner; and Penning, Hans, to Rheinische Braunkohlenwerke AG. Fluidizing bed coking method of brown coal. 3,671,402, Cl. 201-15.000.

Werf Conrad en Stork Hijsch N.V.: *See—*
Van Der Wijden, Franciscus Theodorus Maria, 3,670,830.

Werft, August R. Vehicle. 3,671,051, Cl. 280-11.1et.

Weschler, Milton E. Battery-pintle assembly for a wrist watch. 3,670,491, Cl. 58-23.0ba.

Westendorp, Willem F., to General Electric Company. Shielded inductive device. 3,671,902, Cl. 336-84.000.
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Pavlik, Norman M., 3,671,335.
Sandler, Yehuda L., 3,671,323.
Swanson, John G., 3,671,819.
Westlake, Edward B., Jr. Apparatus and method of making round bottom plastic liners for shipping containers. 3,671,349, Cl. 156-229.000.
Westlake, Edward B., Jr. Method of producing a plastic shopping bag. 3,671,350, Cl. 156-250.000.
Westphal, Kurt; Meiser, Werner; Fue, Ludwig; and Hack, Helmuth, to Farbenfabriken Bayer Aktiengesellschaft. Herbicidal agents. 3,671,523, Cl. 260-248.0as.
Westvaco Corporation: *See—*
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White, Charles H.: *See—*
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White Lily Foods Company, The, mesne: *See—*
Drews, Harvey J.; and Raffensperger, Stanley P., 3,671,264.
White, Norman S., to Sampson Corporation, The. Liquid medicine applicator. 3,670,730, Cl. 128-222.000.
Whitmore, Thomas C.; and Cunningham, Robert G., to Eastman Kodak Company. Method of and apparatus for applying an electrical charge to a moving sheet of flexible material. 3,671,806, Cl. 317-2.00r.
Wicker, Ralph C., to Carlson, Chesley F., Company. Lithographic color analyzer using interference magnification. 3,671,131, Cl. 356-175.000.
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Wideband Jewelry Corporation: *See—*
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Widstrand, John C., to Marathon Electric Manufacturing Corporation. Low-shaft, low-profile electric motor. 3,671,790, Cl. 310-216.000.
Wiechert, Rudolf, to Schering Aktiengesellschaft. 20,20-Ethylene-21-oxosteroids. 3,671,554, Cl. 260-397.300.
Wieck, Karl, to S U P F I N A. Bearing, particularly for the driving means of an oscillating tool. 3,671,093, Cl. 308-183.000.
Wiedeking, Elmar, to Bodenseewerk Perkin-Elmer & Co., GmbH. Graphite tube spectroscopy sample cell including illumination and observation structure. 3,671,129, Cl. 356-85.000.
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Wilkes, Donald F., to Rolamite, Incorporated. Ski bindings. 3,671,052, Cl. 280-11.35t.
Willard, Richard H.: *See—*
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Williams, Albert Etheridge, to United Kingdom Atomic Energy Authority. Nuclear reactor fuel elements. 3,671,393, Cl. 176-73.000.
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Williams, Christian B.: *See—*
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Williams, Jerry G.; and Judd, Joseph H., to United States of America, National Aeronautics and Space Administration. Light regulator. 3,671,105, Cl. 350-161.000.
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Williard, Elwood C.; and Williard, Barbara Ann. Package sleeve. 3,670,879, Cl. 206-65.00d.
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Wilson, Raymond F.; Peck, Reese A.; and Guptill, Frank E., Jr., to Texaco Inc. Conversion of heavy petroleum oils. 3,671,420, Cl. 208-61.000.
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Winston, Eric; and Jacobs, Herbert V., to Jacobs Machine Corporation. Button feed device. 3,670,673, Cl. 112-113.000.
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Kaufman, Otto; Daeuble, Manfred; Witsch, Heinz-Guenter; Luebcke, Enno; and Bayew, Dimiter, 3,671,176.

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Meltzer, Robert I.; and Wittekind, Raymond R., 3,671,544.

Wittlinger, Harold Allen; Wheatley, Carl Franklin, Jr.; and Knapp, Russell Daniel, to RCA Corporation. Sample-hold and read circuit. 3,671,782, Cl. 307-238.000.

Wittnebert, Frederick R., to Parker Pen Company, The. Applicator wick for a writing instrument. 3,671,132, Cl. 401-292.000.

Wobbe, Delbert Edmond: *See—*
Bolt, Richard Robert; and Wobbe, Delbert Edmond, 3,670,543.

Wohead, Michael J. Non-snagging fishing device. 3,670,447, Cl. 43-43.140.

Wohlbach, Harry E.: *See—*
Fleetman, Hobart H.; and Wohlbach, Harry E., 3,671,861.

Wolf, Emanuel, to Ironflex AG. Device for attaching a thermoplastic foil to a supporting structure. 3,671,371, Cl. 161-43.000.

Wolf, Gerhard Dieter: *See—*
Kunzel, Hans-Egon; Wolf, Gerhard Dieter; Blankenstein, Gunter; and Nischk, Gunther, 3,671,614.

Wolfram, Adolf Egmont, to General Electric Company. Television channel indicator common to VHF and UHF and easily programmable to locally available channels. 3,671,869, Cl. 325-455.000.

Wolfson, Alan B.; Patel, Jayantilal M.; and Lawrence, Benjamin, to Procter & Gamble Company, The. Decaffeination process. 3,671,262, Cl. 99-70.000.

Wolfson, Anal B.: *See—*
Patel, Jayantilal M.; and Wolfson, Anal B., 3,671,263.

Wolverine-Pentronix, Inc.: *See—*
Smith, Joseph E., 3,671,157.

Wood, William, to French, Thomas, & Sons Limited. Curtain heading tapes. 3,670,780, Cl. 139-387.000.

Woodbridge, David D.; and Mann, Leland A., to Energy Systems, Inc. Irradiator apparatus with a fluid communicating core and casting baffles. 3,671,741, Cl. 250-44.000.

Woods, Michael Faulkner: *See—*
Blake, Anthony; Halliday, Denis Malcolm; and Woods, Michael Faulkner, 3,671,268.

Woodward, Charles D.: *See—*
Pasek, James E.; and Woodward, Charles D., 3,671,085.

Woodward, Charles D., to General Motors Corporation. Anti-lock modulator with mechanically resettable control valve. 3,671,084, Cl. 303-21.00f.

Woolley, William P. Flexible wheel. 3,671,088, Cl. 305-7.000.

Wormser, Hans H., to Markite Corporation. Rotary potentiometer. 3,671,914, Cl. 338-131.

Worobey, Walter: *See—*
Pitetti, Raymond Charles; and Worobey, Walter, 3,671,823.

Worst, Joseph C., to General Electric Company. Liquid fill control. 3,670,533, Cl. 68-207.

Worth, Gerald W.: *See—*
North, Donald F., Jr.; Thomas, Jerry D.; and Worth, Gerald W., 3,671,224.

Worth Well Surveys, Inc.: *See—*
Stout, Beauford F., 3,670,567.

Wright, Barry, Corporation, mesne: *See—*
Kupfrian, Wilbur J., 3,670,795.

Wright, John B., to Upjohn Company, The. 5-Phenyl-1,2,4-benzothiadiazepine-1,1-dioxides. 3,671,528, Cl. 260-268.0bc.

Wright, John H., to General Electric Company. Grease-like silicone compound. 3,671,429, Cl. 252-25.000.

Wuthrich, Paul, to Timex Corporation. Indexing mechanism for electric/electronic timepieces. 3,670,493, Cl. 58-116.000.

Wynn, Robert W.; and Chiddix, Max E., to General Anilin & Film Corporation. Preparation of 2, 3-dibromo-2-butene-1,4- diol. 3,671,594, Cl. 260-633.000.

Xerox Corporation: *See—*
Britt, James E.; and Hewitt, Robert E., 3,670,700.
Fantuzzo, Joseph; and Punnett, Frazer D., 3,671,118.
Goffe, William L., 3,671,282.
Gunther, Wolfgang H. H., 3,671,467.
Haas, Werner E. L.; and Adams, James E., 3,671,231.
Haas, Werner Erwin Louis; Adams, James Ewing; and Mechlowitz, Blea, 3,671,237.
Houston, Robert D., 3,671,776.
Mason, Lawrence J.; Simpson, George R.; Paradysz, Louis F.; and Chen, Philip L., 3,670,633.
Matsumoto, Seiji; Tamai, Yasuo; and Sto, Masamichi, 3,671,290.
Turner, Lyman H.; and Adamek, John A., 3,671,094.
Weiler, Ernest A., 3,670,701.

Xonics Inc.: *See—*
Proudian, Andrew Peter; and Balser, Martin, 3,671,927.

Yabuuchi, Hiroshi: *See—*
Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; Yabuuchi, Hiroshi; and Takao, Hiroyoshi, 3,671,492.

Yajima, Ryoichiro: *See—*
Mamiya, Shigeo; and Yajima, Ryoichiro, 3,671,913.

Yamada, Yoshitaka; Sakurai, Moritaro; and Kumashiro, Izumi, to Ajinomoto Co., Inc. Production of a heterocyclic compound having an imidazole ring. 3,671,649, Cl. 260-252.000.

Yamaguchi, Hisashi: *See—*
Haga, Teruhide; Yamaguchi, Hisashi; and Hirao, Yotaro, 3,671,255.

Yamaguchi, Mario: *See—*
Tanaka, Tetsuo; Masumura, Masao; Toguchi, Akihiro; and Yamaguchi, Mario, 3,671,507.

Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo, to Kabushiki Kaisha Ricoh. C_5 to C_{16} aliphatic alcohols used as defoaming agents in zinc oxide-resin dispersions. 3,671,235, Cl. 96-1.800.

Yamamoto, Kazuo: *See—*
Yasui, Koichi; Yamamoto, Kazuo; Itami, Kazuo; Fujisawa, Kiyoshi; and Saskai, Toshio, 3,671,279.

Yamauchi, Choji: *See—*
Maekawa, Hiroshi; and Yamauchi, Choji, 3,671,274.

Yamazaki, Yoichi: *See—*
Takenaka, Sadao; Kishida, Soichiro; and Yamazaki, Yoichi, 3,670,740.

Yanagida, Koichiro: *See—*
Okazaki, Takayoshi; Tashiro, Kiroku; and Yanagida, Koichiro, 3,671,376.

Yano, Tadashi: *See—*
Sasaki, Nobuyuki; Oba, Shunzo; and Yano, Tadashi, 3,671,915.

Yao assor. to said Chin: *See—*
Chin, Wesley S. C.; and Yao, Kou C., 3,671,367.

Yao, Kou C.: *See—*
Chin, Wesley S. C.; and Yao, Kou C., 3,671,367.

Yarm, Jay Martin, to United Aircraft Corporation. Frangible tension shock absorber. 3,670,852, Cl. 188-1.00c.

Yashiro, Hideo: *See—*
Abe, Isamu; Yashiro, Hideo; Sori, Naoyuki; Hatano, Sotaro; Katsumoto, Tomiyasu; and Suzuki, Tadao, 3,670,395.

Yasuda, Nobuaki: *See—*
Murakami, Yoshio; Higashinakagawa, Iwao; Yasuda, Nobuaki; and Takeno, Syozo, 3,671,312.

Yasui, Koichi; Yamamoto, Kazuo; Itami, Kazuo; Fujisawa, Kiyoshi; and Saskai, Toshio, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the continuous xanthation and solution of alkali cellulose. 3,671,279, Cl. 106-165.000.

Yawata Iron & Steel Co., Ltd.: *See—*
Akuta, Tomohiko; Seya, Atsumi; and Hashirizaki, shinya, 3,670,833.

Yayo Plastic Yoki Co., Ltd.: *See—*
Ochi, Takashi, 3,671,360.

Yee, John W., to General Motors Corporation. Steerable lamp system for motor vehicles. 3,671,733, Cl. 240-8.250.

Yokogawa Electric Works, Ltd.: *See—*
Watanabe, Kazutaka, 3,671,671.

Yokoyama, Tohei: *See—*
Hosokawa, Masuo; Yokoyama, Tohei; and Nakagawa, Fumio, 3,670,886.

Yoneyama, Masakazu; Shimamura, Isao; Iwano, Haruhiko; and Ohi, Reiichi, to Fuji Photo Film Co., Ltd. Development of silver halide photographic materials. 3,671,247, Cl. 96-663.000.

Yoo, Jin Sun, to Atlantic Richfield Company. Process for hydrogenating acrylonitrile to propionitrile. 3,671,565, Cl. 260-465.100.

Yorganjian, John James, to RCA Corporation. Resettable logic gate multivibrator. 3,671,881, Cl. 331-57.000.

Yoshibayashi, Tsutomu: *See—*
Fudemoto, Isao; Yoshibayashi, Tsutomu; and Miyamura, Tadao, 3,671,886.

Yoshida, Ei. Method of determining pitch names in various keys and pitch name determining slide rule. 3,671,661, Cl. 84-473.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Yoshieda, Keiichi, 3,671,347.

Yoshieda, Keiichi, to Yoshida Kogyo Kabushiki Kaisha. Method and apparatus for attaching a reinforcing material to a slide fastener chain. 3,671,347, Cl. 156-160.000.

Yoshihara, Mitsuo; and Mizutani, Kazunori, to Nitto Electric Industrial Co., Ltd. Modification of alicyclic or aliphatic diepoxy compounds. 3,671,592, Cl. 260-2.0ep.

Yoshikawa, Isamu: *See—*
Nishimaki, Ko; and Yoshikawa, Isamu, 3,670,917.

Yosida, Akio: *See—*
Tsuda, Minoru; Yosida, Akio; and Yuki, Takamitsu, 3,671,468.

Yost, Paul E. Inflatable display. 3,670,440, Cl. 40-215.000.

Young, Donald G., to Dow Corning Corporation. Primer composition for adhering silicone elastomer to substrates. 3,671,483, Cl. 260-32.8sb.

Young Radiator Company: *See—*
Christensen, Donald W., 3,670,811.

Yuki, Takamitsu: *See—*
Tsuda, Minoru; Yosida, Akio; and Yuki, Takamitsu, 3,671,468.

Yusa, Haruhiko: *See—*
Amagi, Yasuo; Ohya, Masaki; Shiiki, Zenya; and Yusa, Haruhiko, 3,671,610.

Zech, John D.: *See—*
Sherman, Albert H.; and Zech, John D., 3,671,458.

Zegers, Eduard; and Snijders, Wilfred Andre Maria, to U.S. Philips Corporation. Transmission system for measuring time of transmission. 3,671,864, Cl. 325-38.00a.

Zelenz, Martin L., to Sylvania Electric Products, Inc. Method for fabricating multilayer electrical components. 3,670,379, Cl. 29-25.920.

Zeller, Helen D. Check book holder having master check. 3,671,059, Cl. 283-7.000.

Zellweger Ltd.: *See—*
Genzel, Hans-Ulrich Werner; Hafeli, Hans-Rudolf; and Steiner, Hans Robert, 3,671,718.

Zenner, Walter J.; and Kranz, Raymond E., to Extel Corporation. Carriage drive for high speed printer. 3,670,861, Cl. 197-64.000.

Zerlin, William Max Erich; Avery, Roger Peter; and Royce, David Hugh, to Bunker-Ramo Corporation, The. Push-on connector. 3,671,922, Cl. 339-74.00r.

Ziegler, Hans, to Pfaff Industriemashinen GmbH. Roller-foot for sewing machines. 3,670,678, Cl. 112-235.000.

Ziemba, Richard T., to General Electric Company. Controlled range proximity fuze. 3,670,652, Cl. 102-70.20p.

Ziemek, Gerhard; and Schatz, Friedrich, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Spacing in coaxial tubes system. 3,670,772, Cl. 138-114.000.

Zimmermann, Joseph James, to GTE Automatic Electric Laboratories Incorporated. Device for positioning a magnetic head to a selected track of a multi-track recording tape. 3,671,043, Cl. 274-4.00a.

Zimnoch, Joseph J.: *See*—
Szumila, Anthony D.; Zimnoch, Joseph J.; Bechtel, John D.; and Steinberg, Harvey M., 3,671,865.

Zink, Paul R.: *See*—
Kiewicz, Frank M.; and Zink, Paul R., 3,670,420.
Kiewicz, Frank M.; and Zink, Paul R., 3,670,421.

Zinsco Electrical Products: *See*—
Belttary, Harold E.; and Palmer, John G., 3,671,908.

Ziober, Johnnie J.: *See*—
Mott, George F.; and Ziober, Johnnie J., 3,670,507.

Zoecon Corporation: *See*—
Siddall, John B.; and Calame, Jean Pierre, 3,671,558.

Zschocke, Albrecht: *See*—
Fischer, Adolf; Koenig, Karl-Heinz; Steinbrunn, Gustav; and Zschocke, Albrecht, 3,671,586.

Zschocke, Albrecht; Rohr, Wolfgang; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted hydantoins. 3,671,540, Cl. 260-309.500.

Zuckerman, Marc Robert: *See*—
Tangredi, Albert Joseph; and Zuckerman, Marc Robert, 3,670,947.

Zweig, Arnold, to American Cyanamid Company. Photodecomposition of oxazolidinediones and similar anhydrides. 3,671,239, Cl. 96-27.00r.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JUNE, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allen, Perry E. Electric lock release. Re. 27,390, 6–20–72, Cl. 292—201.

A.M.I.S. Apparecchi e Macchine Idrauliche-Speciali S.p.A.: *See*—
D'Urso, Nicola. Re. 27,399.

Aselman, Edward C., Jr., to T.N.E. Inc. Control apparatus for an electrically operable device. Re. 27,393, 6–20–72. Cl. 317—13 R.

Azonic Products, Inc.: *See*—
Brown, Maurice H. Re. 27,398.

Babigan, Raymond. Electrical conductor containing an ionizable gas and radioactive material to ionize the gas. Re. 27,397, 6–20–72, Cl. 174—9 F.

Bergman, Robert J., and L. R. Prohofsky, to Sperry Rand Corp. Solid stack memory. Re. 27,395, 6–20–72, Cl. 340—174 BC.

Brown, Maurice H., to Azonic Products, Inc. Apparatus for forming wire control elements. Re. 27,398, 6–20–72, Cl. 156—510.

Ceskoslovenska Akademie Ved: *See*—
Wichterle, Otto, and Lim. Re. 27,401.

Columbia Gas System Service Corp.: *See*—
Hemmert, Raymond A. Re. 27,396.

Dennison Mfg. Co.: *See*—
Merser, Francis G. Re. 27,391.

D'Urso, Nicola, to A.M.I.S. Apparecchi e Macchine Idraulicha-Speciali S.p.A. Nonreturn valves. Re. 27,399, 6–20–72, Cl. 137—512.

Heimbigner, Gary L., to North American Rockwell Corp. Closed loop logic gate multiple phase clock signal generator. Re. 27,394, 6–20–72, Cl. 331—57.

Hemmert, Raymond A., to Columbia Gas System Service Corp. Warm air furnace with radiant burner. Re. 27,396, 6–20–72, Cl. 263—20.

Lim, Drahoslav: *See*—
Wichterle, Otto, and Lim. Re. 27,401.

Merser, Francis G., to Dennison Mfg. Co. Connector for holding articles together. Re. 27,391, 6–20–72, Cl. 24—16 PB.

Mobil Temp, Inc.: *See*—
Robinson, Donald E. Re. 27,392.

Nickola, Anne D. Mounting pedestal for utilities. Re. 27,400, 6–20–72, Cl. 317—99.

North American Rockwell Corp.: *See*—
Heimbigner, Gary L. Re. 27,394.

Plaven, Erik. Apparatus for extracting starch and gluten from a dough of wheat flour. Re. 27,402, 6–20–72, Cl. 127—25.

Prohofsky, Le Roy A.: *See*—
Bergman, Robert J., and Prohofsky. Re. 27,395.

Robinson, Donald E., to Mobil Temp, Inc. Heater construction. Re. 27,392, 6–20–72, Cl. 126—91 A.

Sperry Rand Corp.: *See*—
Bergman, Robert J., and Prohofsky. Re. 27,395.

T.N.E. Inc.: *See*—
Aselman, Edward C., Jr. Re. 27,393.

Wichterle, Otto, and D. Lim., to Ceskoslovenska Akademie Ved. Cross-linked hydrophilic polymers and articles made therefrom. Re. 27,401, 6–20–72, Cl. 260—2.5 R.

LIST OF PLANT PATENTEES

Cerro Gordo Nursery, Inc.: *See*—
Pennock, Charles F. 3,219.

Duffett, William E.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,212.
Jessel, Walter H., Jr., and Duffett. 3,213.
Jessel, Walter H., Jr., and Duffett. 3,214.
Jessel, Walter H., Jr., and Duffett. 3,215.
Jessel, Walter H., Jr., and Duffett. 3,216.

Hancock, M. Leslie, to Monrovia Nursery Co. Euonymus fortunei shrub. 3,211, 6–20–72, Cl. 63.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,215, 6–20–72, Cl. 77.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,213, 6–20–72, Cl. 78.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,214, 6–20–72, Cl. 79.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemom plant. 3,215, 6–20–72, Cl. 77.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,216, 6–20–72, Cl. 79.

Manatee, Inc.: *See*—
Vogel, Paul A. 3,218.

Monrovia Nursery Co.: *See*—
Hancock, M. Leslie. 3,211.

Pennock, Charles F., to Cerro Gordo Nursery, Inc. Dracaena celles. 3,219, 6–20–72, Cl. 88.

Pratt, Lester P., to Van Mell Nursery, Inc. Peach tree. 3,217, 6–20–72, Cl. 43.

Van Mell Nursery, Inc.: *See*—
Pratt, Lester P. 3,217.

Vogel, Paul A., to Manatee, Inc. Chrysanthemum plant. 3,218, 6–20–72, Cl. 82.

Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,212.
Jessel, Walter H., Jr., and Duffett. 3,213.
Jessel, Walter H., Jr., and Duffett. 3,214.
Jessel, Walter H., Jr., and Duffett. 3,215.
Jessel, Walter H., Jr., and Duffett. 3,216.

LIST OF DESIGN PATENTEES

Adelson, Alexander M., to Wild Rover Corp. Electrical switch housing. 223,924, 6–20–72, Cl. D26—13.

Ament, Myron J., to Wallace-Murray Corp. Bathroom toilet unit. 223,916, 6–20–72, Cl. D23—49.

Ament, Myron J., to Wallace-Murray Corp. Bathroom lavatory unit. 223,917, 6–20–72, Cl. D23—49.

American Hospital Supply Corp.: *See*—
John, Raymond. 223,978.

American Standard, Inc.: *See*—
Niemann, James E. 223,913.

Ampex Corp.: *See*—
Lauer, Darrel A. 223,928.
Matsuda, Hari K. 223,930.
Matsuda, Hari K. 223,931.

Anaconda Aluminum Co.: *See*—
Kuniansky, Raymond L. 223,902.

Ashby, Frederick R., and L. A. Ropella, to U.S. Plywood-Champion Papers, Inc. Door-transom assembly. 223,909, 6–20–72, Cl. D13—1.

Associated Mills, Inc.: *See*—
Grube, Clifford E., and Stern. 223,976.

Aweida, Jesse I.: *See*—
Kavanagh, Thomas S., Ralston, Campbell, Aweida, and Thurmer. 223,922.

Babcock, William F.: *See*—
Brown, George Z., and Babcock. 223,915.

Bates, Dana B., to Simpson Timber Co. Core for paper rolls. 223,894, 6–20–72, Cl. D8—220.

Berchert, Viola M. Protective cover for counter corners. 223,895, 6–20–72, Cl. D8—263.

Binks, Ronald, to Global Systems Design Corp. Telephone instrument. 223,929, 6–20–72, Cl. D26—14.

Bissell, James D., to Cabitec, Inc. Game board. 223,937, 6–20–72, Cl. D34—5.

Bongort, Edgar A.: *See*—
Hawkins, Harold V., Dick, and Bongort. 223,925.

Borg-Warner Corp.: *See*—
Saternus, Joseph F. 223,970.

Bousquet, Charles E. Floor care coupler. 223,945, 6–20–72, Cl. D37—3.

Boyertown Burial Casket Co.: *See*—
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Braun A.G.: *See*—
Greubel, Jurgen. 223,975.

Brown, George Z., and W. F. Babcock, to Dover Corp. Combined dispensing nozzle and guard therefor. 223,915, 6–20–72. Cl. D23—37.

Cabitec, Inc.: *See*—
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Cammelot, Peter A., and L. F. Duvall, to The Quaker Oats Co. Expanded cereal food product. 223,891, 6–20–72, Cl. D1—1.

Campbell, Ronald R.: *See*—
Kavanagh, Thomas S., Ralston, Campbell, Aweida, and Thurmer. 223,922.

Caputo, Terese. Toy animal. 223,935, 6–20–72, Cl. D34—2.

Carter, Ronald D., to The Stanley Works. Flower shear. 223,893, 6–20–72, Cl. D8—5.

Citizen Watch Co., Ltd.: *See*—
Ohtsu, Yutaka. 223,965.
Colgate-Palmolive Co.: *See*—
Douglas, Livingston C. Miles, and McGhie. 223,900.
Collura, Francesco, to Keuffel & Esser Co. Stand for an electrically-powered eraser or the like. 223,968, 6–20–72, Cl. D74—5.
Collura, Francesco, to Keuffel & Esser Co. Electrically-powered eraser or the like. 223,969, 6–20–72, Cl. D74—7.
Columbus McKinnon Corp.: *See*—
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Cone, Richard E., to The Delphos Bending Co. Snow sled. 223,942, 6–20–72, Cl. D34—15.
Creative Creations, Inc.: *See*—
Feuer, Perry. 223,977.
Crew, Robert T., and O. F. George. Combined garment and trash bag. 223,897, 6–20–72, Cl. D9—250.
Current, Wayne A., to The Singer Co. Portable sewing machine housing. 223,966, 6–20–72, Cl. D70—1.
Daher, Theodore G., to General Electric Co. Clock or similar article. 223,946, 6–20–72, Cl. D42—7.
Daher, Theodore G., to General Electric Co. Clock or similar article. 223,947, 6–20–72, Cl. D42—7.
Daher, Theodore G., to General Electric Co. Clock or similar article. 223,948, 6–20–72, Cl. D42—7.
Delphos Bending Co., The: *See*—
Cone, Richard E. 223,942.
Dick, Ralph A.: *See*—
Hawkins, Harold V., Dick, and Bongort. 223,925.
Douglas, Livingston C., G. D. Miles, and R. P. McGhie, to Colgate-Palmolive Co. Dispensing closure. 223,900, 6–20–72, Cl. D9—278.
Dover Corp.: *See*—
Brown, George Z., and Babcock. 223,915.
Duvall, Leroy F.: *See*—
Cammelot, Peter A., and Duvall. 223,891.
Edwards, Bryant. Packaging cup or the like. 223,898, 6–20–72, Cl. D9—216.
Ehrensaal, Jay, to Swank, Inc. Card ejector case, or similar article. 223,979, 6–20–72, Cl. D87—3.
Elpper, Gertrude. Noodle press. 223,949, 6–20–72, Cl. D44—29.
Electrohome Ltd.: *See*—
McQuarrie, Harvey K. 223,962.
Eprad Inc.: *See*—
Gray, Geoffrey T. 223,918.
Fedtro, Inc.: *See*—
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Feuer, Perry, to Creative Creations, Inc. Combined doll and mirror. 223,977, 6–20–72, Cl. D86—10.
Frazer, John S., to Union Carbide Corp. Jug. 223,896, 6–20–72, Cl. D9—42.
Fritz, Albert J., and A. J. Panzica, to Schwinn Bicycle Co. Bicycle seat. 223,980, 6–20–72, Cl. D90—16.
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Global Systems Design Corp.: *See*—
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Gran, William A., to The Vendo Co. Cigarette vending machine. 223,957, 6–20–72, Cl. D52—3.
Gray, Geoffrey T., to Eprad Inc. Electric heater housing. 223,918, 6–20–72, Cl. D23—123.
Grube, Clifford E., and R. J. Stern, to Associated Mills, Inc. Steam hair curler housing. 223,976, 6–20–72, Cl. D86—10.
Greubel, Jurgen, to Braun A.G. Hair dryer. 223,975, 6–20–72, Cl. D86—10.
Hauser, Jon W., to General Aviation Electronics, Inc. Glideslope indicator. 223,958, 6–20–72, Cl. D52—6.
Hawkins, Harold V., R. A. Dick, and E. A. Bongort, to Columbus McKinnon Corp. Pendant hoist control. 223,925, 6–20–72. Cl. D26—13.
Herricht, Fred, to Boyertown Burial Casket Co. Burial casket. 223,903, 6–20–72, Cl. D19—1.
Irelan, Edward A., to Sunbeam Corp. Illuminable makeup mirror. 223,973, 6–20–72, Cl. D86—10.
Ishihara, Koji: *See*—
Momose, Keigo, Ishihara, and Motonaka. 223,923.
John, Raymond, to American Hospital Supply Corp. Surgical clip. 223,978, 6–20–72, Cl. D83—12.
Kahn, Robert D., to Fedtro, Inc. Master control panel for alarm systems or the like. 223,926, 6–20–72, Cl. D26—13.
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CLASSIFICATION OF PATENTS

ISSUED JUNE 20, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

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250.04	3,670,354
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176	3,671,194
200	3,671,197
209.1	3,671,192
230PC	3,671,195
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284	3,671,199
300	3,671,200
307	3,671,201
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271	3,670,390
273	3,670,391
411	3,670,392
423	3,670,393
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471.1	3,670,395
471.3	3,670,396
472.3	3,670,397
505	3,670,398
509	3,670,399
527.5	3,670,400
563	3,670,402
571	3,670,403
574	3,670,404
593	3,670,406
596	3,670,405
	3,670,407
602	3,670,408
625	3,670,409

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180	3,670,411
276	3,670,412
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12N	3,670,426
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39	3,670,428

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77.3	3,670,433

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126B	3,670,437
129C	3,670,438
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215	3,670,440

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40	3,670,450
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209	3,671,209

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360	3,670,455

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298	3,670,467
394	3,670,463

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298	3,670,468
395	3,670,470
638	3,670,471

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55	3,670,474
234	3,670,475

CLASS 54

8	3,670,476

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416	3,670,479
430	3,670,480

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314	3,670,483

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77.3	3,670,487
77.4	3,670,488
140	3,670,489
156	3,670,490

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28A	3,670,492
116	3,670,493

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25	3,670,495
39.32	3,670,497
54	3,670,498
	3,670,499
57R	3,670,500
261	3,670,501
288	3,670,496
324	3,670,502

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.5	3,670,503
3	3,670,504
14	3,670,505
35	3,670,506
46.5	3,670,507
	3,670,515
63	3,670,508
69	3,670,509
72.1	3,670,510
72.3	3,670,511
	3,670,513
72.4	3,670,514
72.6	3,670,512

CLASS 62

35	3,670,516
45	3,670,517
116	3,670,519
167	3,670,518
314	3,670,520
329	3,670,521
333	3,670,522
344	3,670,523

CLASS 63

18	3,670,524
23	3,670,525

CLASS 65

5	3,671,210
234	3,671,211

CLASS 66

20	3,670,526
50R	3,670,527
147	3,670,528
177	3,670,529

CLASS 68

17A	3,670,530
177	3,670,531
188	3,670,532
207	3,670,533

CLASS 69

30	3,670,534

CLASS 70

58	3,670,535
99	3,670,536
120	3,670,537
271	3,670,538
299	3,670,539
421	3,670,540

CLASS 71

77	3,671,212
94	3,671,213
95	3,671,214
97	3,671,215
100	3,671,216
105	3,671,217
115	3,671,218
121	3,671,219

CLASS 72

8	3,670,541
	3,670,542
41	3,670,543
49	3,670,544
58	3,670,545
63	3,670,546
75	3,670,547
187	3,670,548
208	3,670,549
239	3,670,550
	3,670,587
252	3,670,551
263	3,670,552
289	3,670,588
307	3,670,553
347	3,670,554
370	3,670,555
402	3,670,556
421	3,670,557

CLASS 73

17R	3,670,558
35	3,670,559
37	3,670,560
61.2	3,670,561
71.5	3,670,562
71.6	3,670,563
117.1	3,670,564
117.3	3,670,565
151	3,670,566
154	3,670,567
159	3,670,568
180	3,670,569
190R	3,670,570
194R	3,670,571
342	3,670,572
379R	3,670,574
379	3,670,573
388	3,670,575
393	3,670,576
423R	3,670,577

CLASS 74

5.6	3,670,578
	3,670,585
63	3,670,579
86	3,670,581
88	3,670,582
89.15	3,670,583
199	3,670,584
	3,670,586
325	3,670,589
353	3,670,590
492	3,670,591
493	3,670,592
574	3,670,593
688	3,670,595
689	3,670,594
710.5	3,670,596
752E	3,670,597
815	3,670,580
866	3,670,598
869	3,670,599

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.5B	3,671,220
20F	3,671,221
83	3,671,222
122	3,671,223
129	3,671,224
157.5	3,671,225
175.5	3,671,226
178AC	3,671,227
207	3,671,228
211	3,671,229
213	3,671,230

CLASS 76

36	3,670,600
83	3,670,601

CLASS 81

52.4	3,670,602
53R	3,670,603
98	3,670,604
125	3,670,605

CLASS 82

1C	3,670,606
	3,670,607
36A	3,670,608

CLASS 83

37	3,670,609
55	3,670,610
81	3,670,611
99	3,670,612
139	3,670,613
208	3,670,614
367	3,670,615
397	3,670,616

CLASS 84

1.01	3,671,658
1.17	3,671,659
330	3,670,617
349	3,671,660
473	3,671,661

CLASS 85

1JP	3,670,618
9	3,670,619

CLASS 89

1.5B	3,670,620
1.8	3,670,621
14C	3,670,622
34	3,670,623
47	3,670,624

CLASS 90

86	3,670,625

CLASS 91

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167	3,670,627
358A	3,670,628

CLASS 92

72	3,670,629
129	3,670,630

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50V	3,670,631

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4.5R	3,670,632
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10CT	3,670,636
	3,670,637
10C	3,670,634
	3,670,635
11L	3,670,639
31CA	3,670,638

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1	3,671,231
1.6	3,671,233
1.8	3,671,232
	3,671,234
	3,671,235
15	3,671,236
27R	3,671,239
27	3,671,237
	3,671,238
29R	3,671,240
29	3,671,241
	3,671,242
36.2	3,671,243
54	3,671,244
64	3,671,245
66	3,671,246
76R	3,671,248
88	3,671,249
	3,671,250
89	3,671,251
90	3,671,252
99	3,671,253
100	3,671,257
101	3,671,254
107	3,671,258
109	3,671,255
	3,671,259
111	3,671,256
122	3,671,260
663	3,671,247

CLASS 98

2.18	3,670,640

CLASS 99

2R	3,671,261
70	3,671,262
	3,671,263
92	3,670,665
94	3,671,264
104	3,671,265
126	3,671,266
128	3,671,267
136	3,671,268
139	3,671,269
171H	3,671,270
174	3,671,271
194	3,671,272
236CC	3,671,273
293	3,670,641
329RT	3,670,642

CLASS 100

37	3,670,643
168	3,670,644

CLASS 101

181	3,670,645
382MV	3,670,646
426	3,670,647

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38	3,670,649
42C	3,670,650
	3,670,651
70.2GA	3,670,654
70.2P	3,670,652
70.2R	3,670,653
79	3,670,655
81	3,670,656
87	3,670,657

CLASS 104

22	3,670,658
101	3,670,659

CLASS 105

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199A	3,670,661
199C	3,670,662
366C	3,670,663
377.6	3,670,664

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	3,671,277

48 3,671,278
116 3,671,280
165 3,671,279
288Q 3,671,281

CLASS 110

7R 3,670,666
8A 3,670,667
3,670,668
3,670,669

CLASS 111

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77 3,670,671

CLASS 112

79R 3,670,672
113 3,670,673
121.12 3,670,675
121.29 3,670,674
158B 3,670,676
199 3,670,677
235 3,670,678
262 3,670,679

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45 3,670,682
65R 3,670,683
66.5P 3,670,684
74A 3,671,315
162 3,670,685
230 3,670,686

CLASS 115

18R 3,670,687

CLASS 116

34 3,670,688
112 3,670,689
3,670,690
119 3,670,691
124B 3,670,692

CLASS 117

10 3,671,283
16 3,671,282
21 3,671,284
33.3 3,671,286
36.4 3,671,287
37LE 3,671,290
39 3,671,288
47A 3,671,289
54 3,671,291
62 3,671,292
74 3,671,293
75 3,671,285
76 3,671,294
93.31 3,671,295
100B 3,671,296
113 3,671,297
115 3,671,298
116 3,671,299
118 3,671,300
122P 3,671,301
123A 3,671,302
136 3,671,304
137 3,671,303
138.8F 3,671,305
138.8N 3,671,306
139.4 3,671,307
139.5A 3,671,308
156 3,671,310
201 3,671,309
211 3,671,311
212 3,671,312
3,671,313
213 3,671,314
216 3,671,317
333 3,671,286

CLASS 118

5 3,670,693
24 3,670,694
63 3,670,695
320 3,670,696
408 3,670,697
425 3,670,698
629 3,670,699
636 3,670,700
637 3,670,701

CLASS 119

52R 3,670,702

CLASS 121

990 3,670,577

CLASS 122

406R 3,670,703
448S 3,670,704

CLASS 123

8.47 3,670,705
32EA 3,670,706
90.57 3,670,707
103E 3,670,708
124R 3,670,709
140MP 3,670,710

CLASS 124

25 3,670,711
30R 3,670,712

CLASS 126

91A Re.27,392
110R 3,670,713
165 3,670,714
204 3,670,716
270 3,670,717

CLASS 127

25 Re.27,402
46R 3,671,316

CLASS 128

1R 3,670,718
2A 3,670,719
2.05G 3,670,720
2.05V 3,670,715
6 3,670,721
3,670,722
64 3,670,723
92D 3,670,724
149 3,670,725
188 3,670,726
214C 3,670,728
214R 3,670,727
214.4 3,670,729
222 3,670,730
284 3,670,731
297 3,670,732
305 3,670,733
3,670,734
327 3,670,735
404 3,670,736
422 3,670,737
549 3,670,738

CLASS 130

27T 3,670,739

CLASS 131

261R 3,670,740

CLASS 132

5 3,670,741
88.7 3,670,742

CLASS 134

45 3,670,743
57R 3,670,744
107 3,670,746

CLASS 135

1R 3,670,747
5.1 3,670,750
20 3,670,748
33C 3,670,749

CLASS 136

6 3,671,318
3,671,319
75 3,671,320
3,671,321
83R 3,671,322
86D 3,671,323
153 3,671,324
178 3,671,325
205 3,671,326
225 3,671,327
230 3,671,328
233 3,671,329

CLASS 137

1 3,670,751
13 3,670,752
81.5 3,670,753
3,670,754
3,670,755
84 3,670,745
102 3,670,756
103 3,670,757
150 3,670,758
171 3,670,759
218 3,670,760
315 3,670,761
342 3,670,762
355.18 3,670,763
357 3,670,764
392 3,670,765
512.15 Re.27,399
515.5 3,670,766
596 3,670,767
606 3,670,768
610 3,670,769
614.04 3,670,770
625.6 3,670,771

CLASS 138

114 3,670,772
155 3,670,773
178 3,670,774

CLASS 139

185 3,670,775
188 3,670,776
247 3,670,777
304 3,670,779
349 3,670,778
387 3,670,780

CLASS 140

71R 3,670,781
93R 3,670,783
93.2 3,670,782
118 3,670,784

CLASS 141

9 3,670,785
92 3,670,786
250 3,670,787

CLASS 143

36R 3,670,788

CLASS 144

193D 3,670,789
213 3,670,790
326A 3,670,791

CLASS 146

81A 3,670,792
94R 3,670,793

CLASS 148

1.6 3,671,330
6.17 3,671,332
6.2 3,671,331
6.27 3,671,333
12.3 3,671,334
28 3,671,335
36 3,671,336
111 3,671,337
175 3,671,338
179 3,671,339
187 3,671,340

CLASS 149

19 3,671,341
21 3,671,342
37 3,671,343

CLASS 151

7 3,670,794
29 3,670,795
41.75 3,670,796

CLASS 156

19 3,671,344
77 3,671,345
145 3,671,346
160 3,671,347
187 3,671,348
229 3,671,349
233 3,671,351
250 3,671,350
267 3,671,352
302 3,671,353
306 3,671,354
309 3,671,356
324 3,671,355
359 3,671,357
401 3,671,358
436 3,671,359
466 3,671,360
472 3,671,361
510 Re.27,398
552 3,671,362
556 3,671,363
574 3,671,364
580 3,671,365
3,671,366

CLASS 160

118 3,670,797
354 3,670,798

CLASS 161

27 3,671,367
38 3,671,368
40 3,671,369
43 3,671,370
3,671,371
58 3,671,372
64 3,671,373
76 3,671,025
93 3,671,374
159 3,671,375
162 3,671,377
165 3,671,376
170 3,671,378
3,671,384
173 3,671,379
175 3,671,380
180 3,671,381
214 3,671,382
252 3,671,383

CLASS 162

152 3,671,385
224 3,671,386
284 3,671,387
304 3,671,388
306 3,671,389

CLASS 164

63 3,670,799
76 3,670,401
95 3,670,800
154 3,670,801
258 3,670,802
267 3,670,803
274 3,670,804
312 3,670,805

CLASS 165

22 3,670,806
39 3,670,807
42 3,670,808
60 3,670,809
70 3,670,810
134 3,670,811
175 3,670,812

CLASS 166

.5 3,670,813
3,670,814
136 3,670,815
252 3,670,816
3,670,817
273 3,670,818
305R 3,670,819
3,670,820
315 3,670,821

CLASS 172

7 3,670,822
128 3,670,823
449 3,670,824
805 3,670,825

CLASS 173

4 3,670,826
146 3,670,827

CLASS 174

9F Re.27,397
28 3,671,662
120SC 3,671,663

CLASS 175

4.5 3,670,828
50 3,670,829
52 3,670,830
3,670,831
57 3,670,832

CLASS 176

18 3,671,392
24 3,671,390
73 3,671,393
79 3,671,394

CLASS 177

1 3,670,833

CLASS 178

5.4ST 3,671,664
6.6P 3,671,665
6.7R 3,671,666
6.8 3,671,391
3,671,667
3,671,668
7.3S 3,671,669
67 3,671,670
68 3,671,671
69A 3,671,672

CLASS 179

1VC 3,671,673
15AT 3,671,674
15FD 3,671,675
16F 3,671,676
18DA 3,671,677
81B 3,671,679
100.1DR 3,671,680
100.2CH 3,671,681
100.2MD 3,671,683
100.2Z 3,671,682
117 3,671,684
156 3,671,685

CLASS 180

41 3,670,834
69.1 3,670,835
114 3,670,836
3,670,837
124 3,670,838

CLASS 181

.5NC 3,670,840
.5H 3,670,839
31B 3,670,842
31R 3,670,841
33G 3,670,843
40 3,670,844
57 3,670,845

CLASS 182

19 3,670,849
20 3,670,846
92 3,670,847
115 3,670,848

CLASS 184

6.23 3,670,850

CLASS 187

29R 3,670,851

CLASS 188

1C 3,670,852
71.6 3,670,854
72.6 3,670,853
82.3 3,670,855

CLASS 192

6A 3,670,856
60 3,670,857
107R 3,670,858
112 3,670,859

CLASS 194

1J 3,670,860

CLASS 195

28R 3,671,395
3,671,396
29 3,671,397
31P 3,671,398
100 3,671,399
3,671,400

CLASS 197

18HB 3,671,678
64 3,670,861

CLASS 198

16 3,670,862
22R 3,670,863
29 3,670,864
33AA 3,670,865
33AC 3,670,866
38 3,670,867
41 3,670,868
185 3,670,869
193 3,670,870

CLASS 200

5EA 3,671,686
11TC 3,671,687
48A 3,671,689
48R 3,671,688
61.45R 3,671,690
61.54 3,671,691
61.86 3,671,692
67G 3,671,693
81H 3,671,694
84R 3,671,695
144B 3,671,696
144R 3,671,697
148R 3,671,698
157 3,671,699
160 3,671,700
166C 3,671,702
166J 3,671,701

CLASS 201

12 3,671,401
15 3,671,402
25 3,671,403

CLASS 202

176 3,671,404

CLASS 204

4 3,671,405
16 3,671,406
32R 3,671,407
43 3,671,408
49 3,671,409
56 3,671,410
130 3,671,411
181 3,671,412
195L 3,671,413
195R 3,671,414
284 3,671,415
297R 3,671,416
320 3,671,417

CLASS 206

13 3,670,871
44R 3,670,872
45.34 3,670,881
46PV 3,670,874
46H 3,670,873
52F 3,670,875
58 3,670,876
59F 3,670,877
62P 3,670,878
65D 3,670,879
65S 3,670,880

CLASS 208

10 3,671,418
57 3,671,419
61 3,671,420
68 3,671,421
79 3,671,422
97 3,671,423
127 3,671,424
216 3,671,425

CLASS 209

2 3,670,882
5 3,670,883
80 3,670,884
80.5 3,670,885
139A 3,670,886

CLASS 210

5 3,670,887
20 3,671,426
71 3,670,888
90 3,670,889
104 3,670,890
128 3,670,891
134 3,670,892
138 3,670,893
164 3,670,894
167 3,670,895
242 3,670,896
321 3,670,897
356 3,670,898

CLASS 211

182 3,670,899

CLASS 212

14 3,670,900

CLASS 213

151 3,670,901

CLASS 214

1P 3,670,902
3,670,904
1Q 3,670,903
6P 3,670,906
16.4A 3,670,905
17DB 3,670,907
24 3,670,908
43 3,670,909
141 3,670,910
312 3,670,911
313 3,670,912
522 3,670,913

CLASS 215

32 3,670,914
48 3,670,915

CLASS 219

10.53 3,671,709
10.75 3,671,703
10.81 3,671,704
69C 3,671,705
69M 3,671,706
74 3,671,707
78 3,671,708
99 3,671,710
117HD 3,671,711
125R 3,671,712
127 3,671,713
203 3,671,714
374 3,671,715

CLASS 220

9F 3,670,916
10 3,670,917
20 3,670,918
54 3,670,919
57 3,670,920
75 3,670,921
97C 3,670,922

CLASS 222

2 3,670,923
3,670,924
3 3,670,925
47 3,670,926
107 3,670,927
288 3,670,928
400.7 3,670,929
527 3,670,930

CLASS 223

71 3,670,931
75 3,670,932

CLASS 224

28B 3,670,933
42.03B 3,670,935
42.1E 3,670,934
42.42 3,670,936
45T 3,670,937
48R 3,670,938

CLASS 225

99 3,670,939

CLASS 226

8 3,670,940

CLASS 227

3,670,941
10 3,670,942
60 3,670,943

CLASS 228

1 3,670,944
4 3,670,945

CLASS 229

4.5 3,670,946
33 3,670,948
39R 3,670,949
40 3,670,950
43 3,670,951
44R 3,670,952
54R 3,670,947
57 3,670,953
3,670,954

CLASS 232

7 3,670,955

CLASS 235

60TN 3,670,957
61.11C 3,671,720
61.11D 3,671,719
61.11E 3,671,718
61.11H 3,671,721
61.12N 3,671,722
61.6A 3,671,716
61.7B 3,671,717
70A 3,670,958
94R 3,670,959
150.1 3,671,725
150.27 3,671,723
151 3,671,724
151.11 3,671,727
151.3 3,671,726
164 3,670,956
186 3,671,729
189 3,671,728
3,671,730
192 3,671,731

CLASS 236
11 3,670,960
CLASS 239
15 3,670,961
62 3,670,962
77 3,670,963
265.019 3,670,964
308 3,670,965
337 3,670,966
412 3,670,967
CLASS 240
8.25 3,671,733
8.3 3,671,732
10.06 3,671,734
41.1 3,671,735
47 3,671,736
84 3,671,738
122 3,671,739
CLASS 241
21 3,670,968
27 3,670,969
3,670,970
69 3,670,971
76 3,670,972
188R 3,670,973
CLASS 242
22 3,670,974
45 3,670,975
47.12 3,670,976
54R 3,670,977
54.4 3,670,978
64 3,670,979
67.1 3,670,980
67.4 3,670,981
71.2 3,670,982
74.2 3,670,983
84.02G 3,670,984
84.43 3,670,985
107.1 3,670,986
118.4 3,670,987
158R 3,670,988
192 3,670,989
3,670,990
197 3,670,991
204 3,670,992
CLASS 244
32 3,670,993
42CC 3,670,994
80 3,670,995
103 3,670,996
110C 3,670,997
121 3,670,998
137 3,670,999
CLASS 248
43 3,671,001
205R 3,671,000
300 3,671,002
361R 3,671,003
467 3,671,004
480 3,671,005
CLASS 249
97 3,671,006
114 3,671,007
155 3,671,008
CLASS 250
41.9ME 3,671,737
43.5R 3,671,740
44 3,671,741
49.5A 3,671,743
49.5E 3,671,742
51.5 3,671,744
61 3,671,745
83.3R 3,671,746
199 3,671,747
201 3,671,748
208 3,671,749
211J 3,671,751
220R 3,671,752
222R 3,671,753
236 3,671,754
237R 3,671,750
3,671,755
CLASS 251
129 3,671,009
151 3,671,010
323 3,671,011
CLASS 252
8.5M 3,671,427
3,671,428
25 3,671,429
32.7E 3,671,430
33.4 3,671,012
33.6 3,671,431
46 3,671,432
49.6 3,671,433
49.8 3,671,434
62.1 3,671,646
62.56 3,671,435
62.58 3,671,436
79.3 3,671,437
90 3,671,438
99 3,671,439
103 3,671,440
153 3,671,441
171 3,671,442
3,671,443
3,671,444
3,671,445
3,671,446
180 3,671,447
3,671,448
182 3,671,449
186 3,671,450
301.1S 3,671,453
301.2SC 3,671,455
301.2 3,671,451
301.4F 3,671,452
3,671,454
305 3,671,456
311.5 3,671,457
351 3,671,458
356 3,671,459
358 3,671,460
3,671,461
429A 3,671,462
448 3,671,463
511 3,671,464
548 3,671,465
CLASS 254
8R 3,671,013
51 3,671,014
142 3,671,015
190 3,671,016
CLASS 256
47 3,671,017
CLASS 259
4 3,671,018
8 3,671,019
10 3,671,020
109 3,671,021
CLASS 260
2EP 3,671,592
2A 3,671,466
2H 3,671,469
2M 3,671,467
2R 3,671,468
2.5AP 3,671,470
2.5R Re.27,401
3,671,471
17.4ST 3,671,472
18PF 3,671,473
20 3,671,474
22R 3,671,475
23AR 3,671,476
23.5A 3,671,477
23.7M 3,671,478
29.1SB 3,671,480
29.6RW 3,671,479
30.2R 3,671,481
30.4N 3,671,482
30.8R 3,671,542
32.8SB 3,671,483
33.4SB 3,671,485
33.6SB 3,671,484
37SB 3,671,546
37N 3,671,486
40R 3,671,487
45.7R 3,671,488
46.5E 3,671,489
47CP 3,671,490
3,671,491
47CZ 3,671,614
75NH 3,671,493
77 3,671,494
3,671,495
77.5AP 3,671,497
77.5CR 3,671,496
78L 3,671,499
3,671,500
3,671,501
78R 3,671,498
79.3MU 3,671,502
79.5B 3,671,503
80.7 3,671,504
80.78 3,671,505
3,671,506
85.5ES 3,671,492
87.1 3,671,508
87.5A 3,671,510
87.5 3,671,509
88.3R 3,671,507
93.7 3,671,511
3,671,513
203 3,671,514
210R 3,671,647
223 3,671,515
229 3,671,516
239BB 3,671,519
239BD 3,671,517
239.3D 3,671,518
240A 3,671,520
240R 3,671,648
244R 3,671,521
247.5R 3,671,522
248AS 3,671,523
249.8 3,671,524
250A 3,671,525
251A 3,671,526
252 3,671,649
268BC 3,671,528
268PL 3,671,527
294.8B 3,671,529
294.8D 3,671,650
294.8F 3,671,512
295F 3,671,530
305 3,671,531
306.7 3,671,533
3,671,534
3,671,537
307B 3,671,538
307C 3,671,535
307H 3,671,539
307.5 3,671,536
309.5 3,671,540
309.6 3,671,541
315 3,671,544
326D 3,671,543
326.5FL 3,671,545
329P 3,671,547
332.2R 3,671,548
343.7 3,671,549
347.8 3,671,550
348R 3,671,551
369 3,671,552
392 3,671,553
397.3 3,671,554
397.4 3,671,555
404 3,671,556
408 3,671,557
410.9R 3,671,558
413 3,671,559
429R 3,671,560
437R 3,671,561
448.8R 3,671,562
463 3,671,563
3,671,651
465F 3,671,564
465.1 3,671,565
465.2 3,671,566
465.8D 3,671,567
3,671,568
3,671,569
468R 3,671,570
471C 3,671,571
485F 3,671,574
485G 3,671,572
488CD 3,671,573
491 3,671,575
497A 3,671,576
3,671,577
515P 3,671,578
517 3,671,579
520 3,671,580
527R 3,671,581
533R 3,671,582
535P 3,671,583
539R 3,671,584
3,671,652
545R 3,671,585
3,671,586
570.7 3,671,587
586B 3,671,588
586R 3,671,589
593R 3,671,590
596 3,671,591
609D 3,671,593
633 3,671,594
648C 3,671,595
658R 3,671,596
666PY 3,671,597
3,671,599
666M 3,671,598
3,671,600
671B 3,671,601
672T 3,671,602
677A 3,671,603
677 3,671,604
678 3,671,605
680E 3,671,606
876R 3,671,607
878R 3,671,608
879 3,671,609
880R 3,671,610
932 3,671,611
987 3,671,612
CLASS 261
26 3,671,023
29 3,671,022
39R 3,671,024
76 3,671,025
CLASS 263
20 Re.27,396
21B 3,671,026
32R 3,671,027
CLASS 264
39 3,671,615
3,671,653
68 3,671,616
89 3,671,617
115 3,671,613
120 3,671,618
168 3,671,619
171 3,671,620
244 3,671,621
263 3,671,622
290 3,671,623
294 3,671,624
CLASS 266
6S 3,671,028
34A 3,671,029
CLASS 267
54 3,671,030
110 3,671,031
CLASS 269
72 3,671,032
CLASS 270
83 3,671,033
CLASS 271
68 3,671,034
76 3,671,035
CLASS 273
33 3,671,036
3,671,037
67R 3,671,038
95R 3,671,039
96R 3,671,040
135A 3,671,041
176AB 3,671,042
CLASS 274
4A 3,671,043
4J 3,671,044
10R 3,671,045
CLASS 277
170 3,671,046
227 3,671,048
235R 3,671,047
CLASS 279
4 3,671,049
47 3,671,050
CLASS 280
11.1ET 3,671,051
11.35M 3,671,054
11.35T 3,671,052
3,671,053
47.32 3,671,056
87.01 3,671,055
124R 3,671,057
166 3,671,058
CLASS 283
7 3,671,059
CLASS 285
54 3,671,060
CLASS 287
20.92W 3,671,061
127 3,671,062
189.36C 3,671,063
CLASS 290
54 3,671,756
CLASS 292
45 3,671,064
175 3,671,065
201 Re.27,390
228 3,671,066
292 3,671,067
CLASS 293
1 3,671,068
CLASS 294
81SF 3,671,069
CLASS 296
65R 3,671,070
69 3,671,071
CLASS 297
32 3,671,072
239 3,671,074
CLASS 298
17S 3,671,073
CLASS 299
79 3,671,075
CLASS 301
37R 3,671,076
CLASS 302
8 3,671,077
28 3,671,078
29 3,671,079
CLASS 303
6C 3,671,080
21BE 3,671,081
3,671,083
21F 3,671,084
3,671,085
21P 3,671,082
23R 3,671,086
60 3,671,087
CLASS 305
7 3,671,088
CLASS 307
10LS 3,671,757
10R 3,671,758
88R 3,671,759
106 3,671,761
116 3,671,760
117 3,671,762
209 3,671,763
3,671,764
251 3,671,769
252UA 3,671,768
252B 3,671,770
252W 3,671,767
268 3,671,771
269 3,671,772
271 3,671,773
273 3,671,774
275 3,671,775
289U 3,671,780
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PLANT PATENTS

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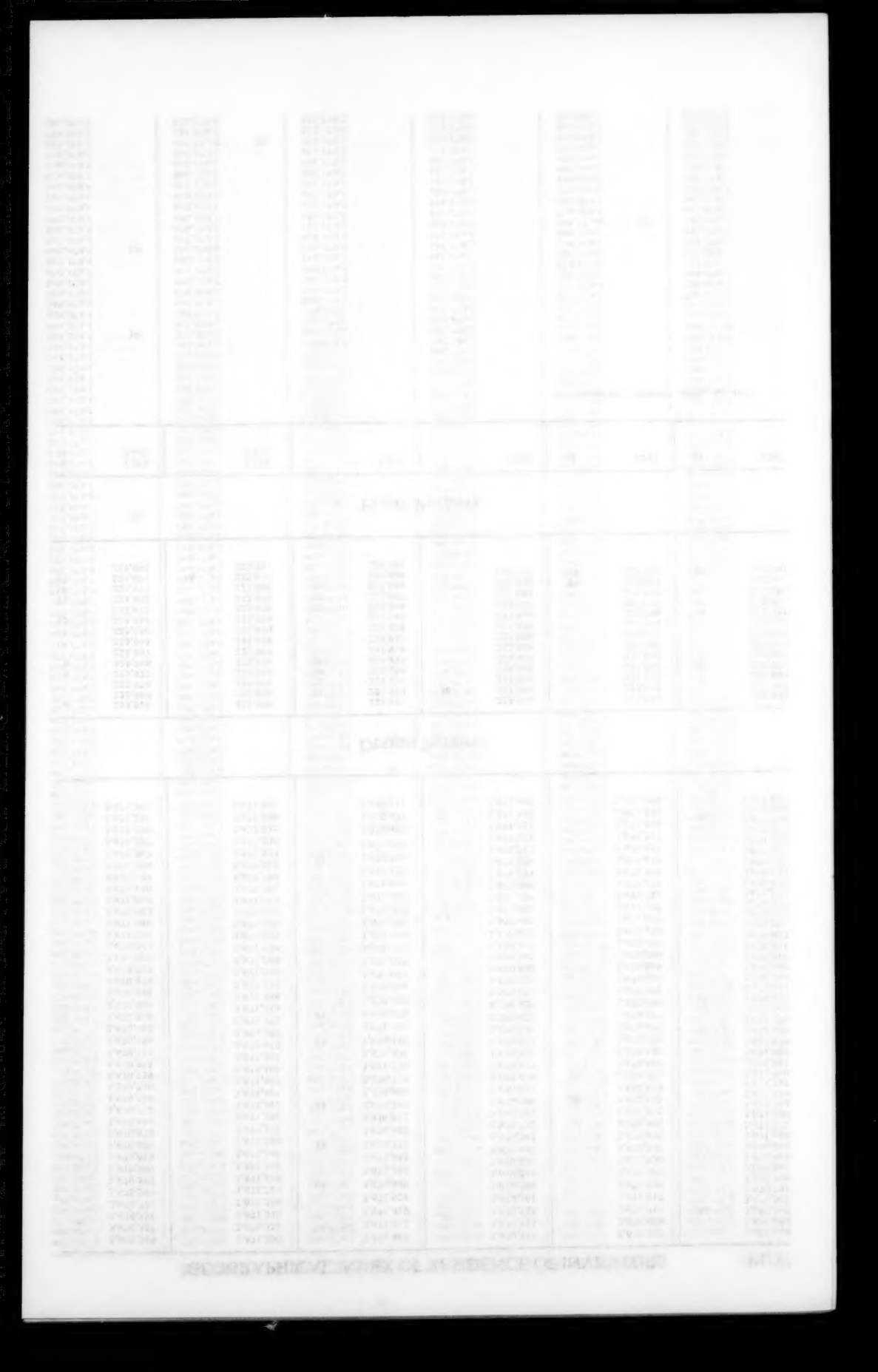

U. S. DEPARTMENT OF COMMERCE
Peter G. Peterson, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Commissioner*